# Professor Willibald Jentschke
# 1996 Winner
# John T. Tate International Award
## *for Distinguished Service to the Profession of Physics*

THE JOHN T. TATE AWARD for distinguished service to the profession of physics recognizes such service by a foreign national and is awarded every few years. Recipients have been: Paul Rosebaud (1961), Harold W. Thompson (1966), Gilberto Bernardini (1972), Abdus Salam (1978), Pierre Aigrain (1981), Edoardo Amaldi (1989), and Roald Z. Sagdeev (1992). The award consists of a medal, $5,000, and a certificate.

THE CERTIFICATE PRESENTED TO JENTSCHKE READS:
*The John T. Tate International Award for Distinguished Service to the Profession of Physics is awarded to Willibald Jentschke in recognition of his leadership in constructing DESY, building it into a truly international center, and integrating Germany into the world community of high-energy and synchrotron radiation physics.*

Willibald Jentschke, born in Vienna, Austria, on December 6, 1911, finished five years of studies in Mathematics and Physics at the University of Vienna with a Ph.D. thesis (1935). The subject of his thesis, ionization due to alpha-particles, led him into the emerging field of nuclear physics. A fellowship and later the position of a "Hochschul-assistent" enabled him to continue nuclear research at the university until the end of the Second World War in 1945.

The main topic of this research was the scattering of gamma rays and of alpha particles off nuclei. One important result was the discovery (1937) of short range fragments when irradiating heavy nuclei. Experiments on the photodisintegration of deuterium (1938) resulted in an early determination of the neutron mass with remarkable accuracy, in agreement with today's measurements. After Hahn's and Strassmann's discovery of uranium fission in 1938, Jentschke intensified his scattering experiments on heavy nuclei and he published several papers on uranium fission shortly before the beginning of the Second World War. During the war years he extended his research to neutron induced fission of other heavy elements and to spontaneous fission as well.

With his work on the range and masses of fission fragments published in 1942 he obtained the degree of "Dr. Habil. and Dozent" allowing him to announce and teach independent courses at the university. Even during war years, most of Jentschke's results were published without any restrictions. On the other hand, it was not known to him that the same experiments were simultaneously pursued in the USA in great secrecy and with much higher intensity.

After the war, he moved to Zell am See in the American occupation zone. It soon became evident that the allied powers had been aware of Jentschke's work. One day he was visited by four Soviet officers clad in uniforms of the US Army. They urged him to follow them to Russia, offering great promises for his future life and research in their country. This event was decisive for Jentschke to accept the help of the US Air Force to bring him to the United States.

His work in the USA began 1947 in the Biophysics Laboratory of the US Air Force in Wright Field, Ohio where he investigated absorption spectra of $CO_2$. One year later, he accepted the position of an Assistant Professor in the Electrical Engineering Department of the University of Illinois. After three years of semiconductor research, he returned to his main field of nuclear physics by switching to the Physics Department. He soon became director of the Cyclotron Division which he held until he left Urbana as a Full Professor in 1956.

The work at the cyclotron in Urbana brought him into close contact with accelerator techniques. Under Jentschke's guidance new technical principles were implemented in the cyclotron with the aim of improving the beam quality. Aside from his nuclear reaction research, he supervised a group of graduate students investigating and developing scintillation counters for nuclear reactions, thus combining solid state and nuclear physics. In pioneering work, he discovered in thallium doped alkalihalogenides at liquid nitrogen temperature the ultrafast scintillation signal which precedes the slow thallium mediated main signal. Largely unnoticed, this discovery found important applications decades later, when electronic circuitry of sufficient speed came into existence.

During the early years after the war, physics in Germany struggled to recover from the blow of the lost war and to catch up with more recent developments of physics research in other countries. Nuclear physics had been hardest hit because all nuclear research was suppressed during the first years after the victory of the allied forces. In an effort to catch up with modern developments, in 1954, the university of Hamburg called Jentschke to accept the directorship of the "Physikalisches Staatsinstitut" in combination with a chair at the university.

It took Jentschke two years of hard negotiations to mobilize sufficient financial support for a project worthwhile to start in Hamburg. His aim was to build a particle accelerator to introduce young physicists into the new field of high-energy physics. The sum finally granted to him, close to 10 million German marks, was unprecedented in German universities, and therefore he finally felt obliged to accept the challenge and move to Hamburg in 1956.

Jentschke's success was felt as a signal in all German universities. There were isolated nuclear physicists spread over a number of universities without adequate research facilities and with hardly any tradition of inter-university cooperation. Using his Viennese charm, Jentschke succeeded in uniting a large number of physicists from different universities. On this basis he was able to raise government funding to support a big common project; an accelerator which would really be competitive on the international level. The result was the concept of the 7.5GeV "Deutschcs Elektronen-Synchrotron" DESY.

In Germany at this time, there were only very few experts in accelerator technology . As a remnant of the war, there could still be felt some international reluctance to cooperate with German physicists. For Jentschke, however, being an Austrian and having many personal friends among US physicists, it was easy to overcome this resistance and to find international advice and support for his ambitious accelerator project.

At the same time, an alternating-gradient electron synchrotron was under construction at Harvard University under the direction of Prof. Stanley Livingston, one of the discoverers of the alternating gradient principle. He generously allowed Jentschke to send young people, DESY's future group leaders, to his laboratory in Cambridge, Massachusetts where they learned the art of accelerator design. With all that help from outside, full operation of the DESY accelerator began in 1964.

The following years brought a multitude of successful experiments. One root of DESY's success was Jentschke's ability to attract the very best young researchers. In contrast to the stiff hierarchy of most German institutions, Jentschke offered the free atmosphere he had enjoyed in the United States, encouraging young people to develop their own initiatives. Jentschke's international connections made DESY particularly attractive for young German physicists seeking contact with the outside world. DESY was also widely open to participant physicists from other countries and other continents. Through the addition of a synchrotron radiation laboratory, the use of DESY was extended to applications in solid-state physics, in biology and even in medicine, again with the effect of attracting a large number of visiting scientists, among them many from foreign countries. Today DESY is the most international among all national laboratories in the world.

During all these years there was a intense exchange of expertise in experimental techniques and accelerator technology between DESY and CERN, the European Center of Nuclear Research in Geneva, Switzerland, where a 30-GeV proton synchrotron was in operation since 1960. Jentschke served in the scientific policy committee of CERN. The international success of Jentschke's DESY and his talent to mediate conflicting interests may have been the main reason why Jentschke was nominated Director General of CERN. He left DESY at the end of 1970 in order to take office at CERN for the following five years. Jentschke's dearest goal at CERN, the same as earlier at DESY, was the promotion of international collaboration among scientists. One result was that, under his directorate, the number of visiting scientists working at CERN more than doubled within four years.

After expiration of his CERN directorate and years filled with administrative duties, Jentschke felt the urge to return to the laboratory floor to an experiment where he could work with his own hands. The Stanford Linear Accelerator Center (SLAC) offered him the opportunity to spend a sabbatical year there. At SLAC he participated in possibly the most important high-energy experiment of that period: the spin-dependent electron-positron scattering experiment demonstrating the correctness of the Weinberg-Salam theory unifying weak and electromagnetic forces.

Back in Hamburg, freed from administrative duties except for his many memberships in international and national advisory boards, he took up teaching at the university and he enjoyed what he had missed for years: direct and intense contacts with young students whom he could fill with enthusiasm for physics. After his retirement from official duties in 1978, he continued to actively follow scientific progress at DESY, participating in many scientific discussions and upholding international connections.

Mention should be made of honorary degrees which he received from the University of Illinois and from the Technical University of Aachen. He was also honored with memberships in the "Oesterreichische Akademie der Wissenschaft" in Vienna and in the "Akadamie der Wissenschaft und der Literatur" in Mainz.