

Othmar Preining
28 June 1927 – 26 September 2007



Professor Dr. Othmar Preining died on September 26, 2007. He taught 28 years at the University of Vienna; numerous students attended his lectures. He tried to educate them not only in basic physics, but also to look for the essential and to see the interrelations. He had many PhD and master students. Six of his co-workers obtained a habilitation under his guidance. His main research area was aerosol science but he was always interested and well informed in all fields of science. In this way, he stimulated ground-breaking work and led science in new directions. He was co-founder of Gesellschaft für Aerosolforschung (GAeF, Association for Aerosol Research), the first international aerosol association in the world.

Othmar Preining was born in Vienna on June 28, 1927. He also attended school in Vienna. Before his school education ended, the Second World War was in full progress, drastically degrading the quality of education. Moreover he was seriously ill and missed almost a full year due to frequent hospitalization. His bad health did not allow for any kind of sport. But Othmar Preining made the best of it, devoting his time to natural sciences. He attended public lectures and bought scientific books. Thus he acquired knowledge that most students in their first years did not have. He finished grammar school with honors and studied mathematics, physics and astronomy at the University of Vienna. He was deeply impressed by Physicist Felix Ehrenhaft. Preining attended all of Ehrenhaft's lectures and seminars and later became his doctoral student, even though he also got offers to do his PhD with famous professors of theoretical physics.

Ehrenhaft determined the charge of the electron by measuring the force on charged sub-micrometer particles suspended in an electric field within a capacitor. Whereas Millikan used oil droplets, Ehrenhaft investigated the movement of metal and carbon particles. Due to the

bright illumination that was needed to see sub-micrometer particles, these particles exhibited photophoresis, which interfered with the measurements. For this reason, Ehrenhaft missed the Nobel Prize. While Ehrenhaft intensively investigated photophoresis, Preining began a thesis on magnetophoresis. During his doctoral work, Preining demonstrated his talent as an experimentalist. He built a fully-automated apparatus for his investigations, which afterwards was used without alteration by three other PhD students. He completed his PhD in 1951.

Shortly before finishing his studies, he was employed by the University of Vienna. In the first years, he developed and demonstrated many impressive experiments that were shown in experimental physics lectures. In the time remaining, he conducted photophoresis research and plasma experiments.

Photophoresis required a profound knowledge of the detection and dynamics of nano-particles. Due to this knowledge, Preining was invited to do research at Caltech in Pasadena (1958 to 1960). Caltech was the Mecca of science and he met outstanding persons such as Pauling, Feynman, Hagen-Smit and others. He maintained lifetime friendships with them and their co-workers. He was asked several times to lead or to build up prestigious research or educational institutions. He preferred to stay in Austria, but he recommended appropriate scientists for the positions offered to him and he kept close contact with them. For example, he recommended Sheldon Friedlander for a position at Caltech – a suggestion that turned out quite good. Whenever possible, he visited research institutions all over the world and worked there. He taught classes and did research at the National Center for Atmospheric Research (NCAR) in Boulder, Colorado, at Georgia Institute of Technology in Atlanta, Georgia, at the University of Minnesota in Minneapolis, at the State University of New York at Albany, and at the University of Missouri - Rolla. He was invited to give innumerable lectures all over the world and was a member of many trend-setting committees.

At the University of Vienna, he was professor from 1969 to 1995, when he became professor emeritus. His classes were interesting but challenging for students. Administration was a serious duty for him. For many years, he was director of the Institute of Experimental Physics, dean of natural sciences, and for one year he was vice rector. As co-director of the inter-university center for computing, he was able to supply an excellent computing infrastructure for the scientists. As president of GAeF, he set the stage for the European Aerosol Conferences (EAC). The first EAC took place in 1987 in Lund, Sweden, under his presidency. Today, the annual EAC is the most important aerosol conference of Europe.

Preining always was open-minded about innovations. The first, and for a long time, the only FAX machine in the physics building was purchased upon Preining's request. When computers were still considered unnecessary, he lent two of his research rooms to the "Prozessrechenanlage Physik", ensuring that the physicists got optimum computer service.

It is very difficult to say whether Preining's strengths were in theory or in experiments. He was exceptionally strong in both. He expected his co-workers to also be strong in both areas. This is one of the keys of success for his Vienna aerosol group. He had very broad scientific interests. Besides aerosol physics, he was interested in information theory, fractals, climate change, interaction between physics and medicine and many other areas of science. He was always ahead of his time. He conducted ground-breaking investigations long before the importance of new findings were generally recognized.

He became a corresponding member of the Austrian Academy of Sciences in 1983 and a full member in 1993. His scientific achievements were honored by many awards, including

the Felix Kuschenitz Award 1962 and Erwin Schrödinger Award 1982, both bestowed by the Austrian Academy of Sciences, ÖAW; Österreichisches, Ehrenkreuz für Wissenschaft und Kunst I. Klasse 1978; Fuchs Memorial Award of the International Aerosol Research Assembly 1994; and Junge Award of the European Aerosol Assembly 2005.

Preining's greatest concern was for a healthy environment. He was a member of the Clean Air Commission of the Austrian Academy of Sciences. Under his chairmanship (1990 to 2002) the commission elaborated air quality criteria for sulfur dioxide, nitric oxides, oxidants, volatile organic compounds, a national environmental plan, an investigation on climate change, and analyses of the effects of power plants to be built. For these studies, up-to-date scientific knowledge was investigated and used for recommendations to efficiently control pollution. The resulting publications documented substantial improvement in the air quality within Austria. His "Austrian Project on Health Effects of Particulates (AUPHEP)" deserves special mention. It investigated the effect of particulate pollution on health and was an interdisciplinary cooperation of physicists, chemists, medical scientists, the environmental departments of all provincial governments, and the Federal Environmental Agency of Austria. He managed to bring together the scientists and administrators, allocate the needed funds, and coordinate the scientific work.

Othmar Preining was an outstanding person, a visionary scientist who shaped environmental science in many areas that were later to become important fields of research and policy. As founder of the Vienna Aerosol School, he introduced a fruitful combination of excellent theory with solid experimental work in all fields of aerosol science, and he inspired the group around him for many decades. As a responsible scientist, he tirelessly worked for the environment but constantly kept an eye on the system as a whole. He was always very active. During his last years, he was frequently hospitalized, but he took scientific literature with him and continued planning the next projects. He never was in good health; he always had to fight for it, but he never showed it. Death suddenly ended his activities.

*Biography prepared by
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