

IN MEMORIAM

LOTHAR W. FROMMHOLD

Lothar Werner Frommhold was born on April 20, 1930, in Würzburg, Germany, to Karl Otto Walter and Karolina Bernhardt Frommhold, the third of four children. His father was a commercial correspondent working in international trade. After several moves, the family arrived in Hamburg, where he would receive most of his education, two months before the outbreak of World War II. In 1943, when the bombing of Hamburg started, his mother took Lothar and two of his younger siblings to the Bavarian countryside. He was able to continue his education in a village school until the war ended in 1945.

Lothar describes life after the war:

In the first few months after the war, life in Bavaria was interesting—almost like a dream, I thought. With the schools destroyed, I roamed the forests and found all sorts of leftovers of the war, such as electronic communication equipment of the defeated army, plenty of explosives and various useful tools and devices. I had some fun with gun powder which was plentiful, but I took a special interest in the radio equipment that I (more or less by myself) disassembled for parts, for building radios to listen to all sorts of broadcasts. Every piece of hardware, such as NiCad batteries and chargers, various types of radio valves (tubes), headphones and so forth, which one needed for that purpose, I scavenged from the woods and creeks. I even cut vacuum tubes open (there were many more available than I could possibly benefit from) to learn which electrode was connected to which pin of the socket, so that I actually could do my tinkering with the undocumented devices.

In 1950, after the family moved back to Hamburg, universities had benefited from the Marshall Plan, so Lothar entered the University of Hamburg. In 1958, he married Margareta Mercedes Benz. Against the advice of family, friends, and relatives that there was no economic security in the sciences, he chose to study physics. He received his *Diplom* in 1956, his *Doctor rerum naturalis* in 1961, and his *Dr. habil* in 1964, under the supervision of Professor Heinz Raether. Lothar was taught quantum mechanics by Pascual Jordan, and many of his classmates

chose theoretical physics. However, Lothar developed an interest in electrical discharges in gases. At the time, this was a rather phenomenological and empirical field of study, but efforts were just beginning to better understand the fundamental atomic, molecular, and ionic collision and reaction processes, such as electron attachment and detachment, molecular ion formations, etc. This held out the hope for a reasonably complete “microscopic” (or atomistic) description of the phenomena. Fortunately, one of the first big digital computers was set up at the university, and Lothar had an opportunity to do some computations related to his doctoral work.

Lothar’s doctoral work on atomic processes and gaseous electronics attracted the attention of several American physicists, including Leonard Loeb at Berkeley, and Manfred “Fred” Biondi at the University of Pittsburgh and his famous (at the time) colleagues at the Westinghouse research facility, Art Phelps and George Schulz.

In 1964, Lothar was selected for a two-year appointment in the Fulbright Scholar Program. Biondi offered him a research position at Pittsburgh to spectroscopically study microwave afterglows. While there he was recruited by Professors WW Robertson and Hans Schlüter and appointed Associate Professor at the University of Texas in 1966.

Richard B. Bernstein introduced Lothar to the collision-induced, super-molecular Raman and infrared spectroscopies discovered in the 1950s by Harry Welsh and associates in Toronto. Lothar decided to investigate van der Waals molecules and super-molecular spectra of molecular collision pairs. In the early eighties, with an advanced double Raman spectrometer and an intense argon ion laser, Lothar investigated the collision-induced Raman spectra of the rare gases. He extended the work to the infrared, which attracted the attention of astronomers and planetary scientists. His extensive opacity tables for mixtures of hydrogen and helium gases were submitted to HITRAN, a well-known spectroscopic data base. In 1994, at the request of Alex Dalgarno, Lothar wrote a

Cambridge Monograph, "Collision-induced Absorption in Gases," a second edition of which appeared in 2006.

Professor Frommhold was among that rare group of physicists who was at home both in the laboratory and doing computations in his office. The early part of his career was devoted to experimental atomic physics. His knowledge, especially in the area of gas discharges, was highly appreciated by faculty and students who regularly sought his advice with their research problems. He generously and patiently provided solutions to both experimental and theoretical questions. Since atomic physics impacted directly or indirectly nearly all areas of physics, Professor Frommhold was considered an invaluable resource in the department as well as nationally and internationally. He published over one hundred papers, which included a number of highly cited works.

Professor Frommhold was a kind and humble man, greatly respected and liked by his colleagues and his students. He retired in 2010 and was honored with emeritus status. He died March 12, 2021, in Austin following the 2019 death of his beloved wife, Margareta. They are survived by two children, Sebastian and Caroline.



Jay C. Hartzell, President
The University of Texas at Austin



Charlotte Canning, Secretary
The General Faculty

This memorial resolution was prepared by a special committee consisting of Professors Melvin Oakes (chair), John Keto, and Mark Raizen.