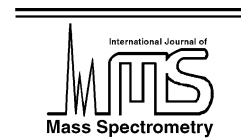




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A tribute to Werner Lindinger

The scientific community lost a great friend and highly esteemed colleague with the tragic drowning of Werner Lindinger in Hawaii on February 16, 2001.

Born in 1944 in the small town of Brixlegg in Tyrol, Werner Lindinger studied physics (1963–1972) at the Leopold Franzens Universität in Innsbruck, Austria. He started his academic career already during these studies by joining in 1967 the newly founded Institut für Atomphysik as a “wissenschaftliche Hilfskraft.” In his thesis, supervised by the head of this institute (Prof. Maximilian Pahl), Werner Lindinger measured the presence of ions in the negative glow of a hollow cathode with a mass spectrometer, and mass spectrometry and ions became the theme of his scientific life. Already towards the end of his thesis, he showed his great talent by finding a way to analyze the measured radial ion densities and deduce corresponding reaction rate constants for the underlying ion–molecule reactions occurring in the hollow cathode discharge, thus, leading to a first acclaimed publication (W. Lindinger, Reaction rate constants in steady-state hollow-cathode discharges: $\text{Ar} + \text{H}_2\text{O}$ reactions, *Phys. Rev. A* 7 (1973) 328).

Following his Ph.D. degree obtained in 1972 in Innsbruck, Werner initiated his professional career as a Max Kade Foundation post-doctoral fellow in the NOAA Aeronomy Lab in Boulder from October 1973 to September 1975. His considerable talent and exceptional energy led to an extremely productive period in Boulder. He rigorously exploited the newly developed flowing afterglow technology for the measurement of thermal and low energy ion–molecule interactions, ion mobilities and ion reactions with neutral molecules mainly. This outstanding research

activity earned him, at an exceptional young age in 1976, the Fritz Kohlrausch prize, the most prestigious award the Austrian Physical Society can hand out.

His warm and outgoing personality led to the formation of many deep friendships in Boulder, many persisting actively throughout his life. His friends were not only in NOAA, but also in JILA and in the Chemistry Department of Colorado University.

Upon his return to the Physics Faculty at Innsbruck, he was one of the leaders instrumental in developing an atomic and ion physics program at the Institut für Atomphysik involving the construction of a new flow drift tube and investigating in detail the dependence of ion–molecule reactions on temperature and energy. After obtaining in 1977 the habilitation for the subject “experimental atomic physics,” he quickly achieved international recognition leading also to a professorship in 1978 at the Institut für Experimentalphysik. In 1987, he was elected head of the newly founded Institut für Ionenphysik in Innsbruck. Lindinger’s group was extremely productive in these years. After constructing one of the first selected ion flow tubes (SIFT, see Lindinger et al., Investigations of ion–molecule reactions using a drift tube with separated ion source, *Int. J. Mass Spectrom. Ion Phys.* 30 (1979) 251), important contributions were made by Werner and his group to ion–molecule reaction kinetics and a variety of ion–molecule interaction processes as well as original contributions to thermochemistry (*Phys. Rev. Lett.* 52 (1984) 2084; *Phys. Rev. Lett.* 54 (1985) 540). A notable example, is the series of studies of molecular ion vibrational quenching in neutral collisions. The first publication of a systematic study on ion vibrational relaxation was in 1983, an Innsbruck publication in *J. Chem. Phys.* 97 (1983) 553, and the

most recent, a publication in 2000, again in *J. Chem. Phys.* 112 (2000) 731. These detailed studies led to greatly increased understanding of the mechanistic processes involved.

In recent years, Lindinger's interests broadened from gaseous electronics. His group extended the application of ion-flow systems to super sensitive detection (in the ppt region) of trace gases in an on-line, real-time manner (with time resolutions below 1 s) by first introducing charge exchange ionization and recently the proton transfer reaction mass spectrometry (PTR-MS) technique. Lindinger and colleagues pioneered its use in a variety of applications in medicine and food analyses, as well as highly time-resolved studies of the emissions from vegetation and biomass burning to the atmosphere. Starting with a close collaboration between Werner's group and the Max Planck Institut für Chemie in Mainz, many research groups around the world are now applying this technique for studies of biosphere-atmosphere interactions using instruments built in a company (Ionicon Analytik GmbH) founded by Werner Lindinger in 1998. At the time of his death, he was in Hawaii for the purpose of installing his PTR-MS instrument at the NOAA Clean Air Baseline Station on the volcanic Mauna Loa mountain. It is only fittingly, that this special issue will be presented at the 1st International Conference on Proton Transfer Reaction-Mass Spectrometry, in Innsbruck in January 2003.

Lindinger was together with the late Prof. Franz Howorka, a co-founder 25 years ago of the popular "Symposium on Atomic and Surface Physics (SASP)" held every 2 years, often in Tyrol, but also in other European countries. In recognition of this and also for his outstanding scientific achievements in the field of ion-molecule reactions, Werner received in 1996 the

SASP Schrödinger Award and the Golden Medal of the Comenius University, Bratislava.

In addition to his prolific publication record (see below), Werner lectured widely in Europe and the US for many years, being a guest professor at the University of Trento and the University of Utah, Salt Lake City and authored numerous contributed and invited reviews (see the most recent one entitled "Ion-molecule reactions" in *Adv. Atom., Mol. Opt. Phys.* 43 (2000) 243).

His scientific achievement was recognized in 1997 by the receipt of Austria's highest science award, the Erwin-Schrödinger Prize of the Austrian Academy of Science.

Werner's interests were broad and varied. In addition to his research and teaching, he had a lively appreciation of art and music. He was a vigorous person physically. Like many (most) Tyroleans, he was an accomplished skier. He was an avid hiker and a regular tennis player. In recent years, he became a serious equestrian, riding in two African safaris.

Werner's extraordinary joy of living made his friendship a rewarding and memorable experience. He will be sorely missed. We lost a dear friend, a generous colleague and an extraordinary scientist.

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