

Prof. Dr. Helmut Moritz
1933 – 2022

Obituary

With profound sadness we have taken notice of the death of a brilliant scientist and highly gifted academic teacher: Helmut Moritz, who passed away on October 21, 2022 at the age of 89.

Born on November 1, 1933 in Graz, Austria, Helmut Moritz attended the Academic high school in Graz. He lost his father during World War II, and as a consequence he grew up under very difficult circumstances. His high aptitude in general and his strong interest in mathematics, natural sciences, music and languages in particular became obvious already during his high school time. In 1956 he completed his study of surveying and geodesy at the University of Technology in Graz, followed by a PhD study which he completed in 1959. For his excellent performance and the outstanding quality of his PhD thesis „*Theory of errors in the function space*“ he was awarded the doctor’s degree by the President of the Republic of Austria – a top honor for an exceptional academic performance in Austria. In his thesis he introduced for the first time the infinite-dimensional Hilbert space into geodesy. In the same year he got married with his beloved Gerlinde, who gave birth to two children, Berta (1960) and Albrecht (1962).

After a three years employment at the Federal Bureau for Metrology and Surveying in Austria he received in 1962 an invitation by the Department of Geodetic Science of the Ohio State University, at that time the undisputed center of geodesy under the chairmanship of Weikko A. Heiskanen. Together with Heiskanen he wrote his first scientific book which became a bestseller in theoretical geodesy, which was translated into several foreign languages and is still up-to-date after more than 50 years: „*Physical Geodesy*“.

Shortly after his return from Columbus to Graz in 1964 he became appointed as an Associate Professor at the University of Hannover and in the same year he was offered the full professor position by the Technical University of Berlin. During this period of time he had devoted himself very intensively to research regarding the problem of Molodensky.

And suddenly, during the hot phase of the student revolution in 1968, he received an invitation by the Graz University of Technology, however, Helmut Moritz preferred to stay in Berlin and rejected the appointment thankfully. A few years later, in 1971 he was again approached by Graz University of Technology to become full professor for Physical Geodesy. This time he could no longer resist and accepted the invitation. And his time in Graz should become a very long and extremely fruitful professional phase of more than 30 years. In his early phase in Graz his research activities had been focused on „*Least squares collocation*“ – a newly developed adjustment technique in Hilbert space which had actually two scientific fathers: Helmut Moritz and Torben Krarup.

Helmut Moritz, a young and very dynamic professor in Graz - an outstanding scientist who had literally written the book of theoretical geodesy from scratch – the news went quickly public. The student community was enthusiastic and loved to attend lectures by Helmut Moritz. He had always been very devoted to his subject and had been carefully listening to his students, to their problems and also to their interests. His exceptional talent of

explaining even very complex matters in an easily „digestible“ way has made him a highly appreciated academic teacher. In his lectures he had always followed the recommendation of Albert Einstein, that one should make things as simple as possible, but not simpler. Yes, simplicity is indeed a result of maturity.

His many years in Graz became probably the most intensive time in his life, scientifically, of course, but also in terms of his strongly growing international profile which could also be observed in his institute and its very international atmosphere. He himself considered the decade from 1975 – 1985 as the most interesting and creative in his entire life. During this time and the consecutive years he had published numerous scientific contributions regarding the geodetic boundary value, the Earth's rotation and the theory of nutation and polar motion, to relativistic effects in reference frames, to satellite gradiometry, and the realization of the Geodetic Reference System 1980. „*Least squares collocation*“ was further extended and developed in all its details, and became an exceptionally powerful and worldwide applied tool in physical geodesy. And it was once again Helmut Moritz, who had compiled and carefully structured the mathematical and statistical foundation of collocation in all its facets in his fundamental book „*Advanced Physical Geodesy*“. Jointly with Ivan I. Mueller he wrote the extensive volume „*Earth Rotation: Theory and Observation*“. His book „*Geometry, Relativity, Geodesy*“, jointly written with B. Hofmann-Wellenhof, may be considered a beautiful sort of bridge building, starting from the curved surface, known to every contemporary geodesist, towards the curved space, and his volume „*Science, Mind and the Universe*“ can be understood as a demanding journey into the vast dimensions of our universe, and its reflection by our human mind, enriched by a glimpse on the special and general theory of relativity and quantum physics. And finally, a strong international demand for a revised new edition of his fundamental early book „*Physical Geodesy*“, now jointly with B. Hofmann-Wellenhof, closed the circle of his scientific volumes in a very harmonic way.

In 2002 when he retired from his professor position at Graz University of Technology Helmut Moritz was very hardly hit by a personal tragedy: the sudden death of his beloved spouse Gerlinde, who was not just a wonderful partner of life and a strong retaining clip for the entire family, but also an adviser to her husband and a sparring partner in scientific matters. This personal break in his life was followed by his strong inclination towards philosophy of natural sciences, to philosophy and religion, up to metamathematics and metabiology. In total his scientific oeuvre comprises more than 230 scientific contributions and 9 scientific books, many of them translated into several languages.

Parallel to his enormous activities in writing scientific articles and books, Helmut Moritz has also been consequently climbing the stepladder of functions in scientific bodies, literally from his Berlin period on. Starting with the chair of the German and, several years later, the Austrian Geodetic Commission, followed by the chair of an IAG Study Group, the section President of IAG, the IAG Vice President and then IAG President, followed by the big step to the position as the IUGG President, and finally the Bureau member of IUCC, the International Council of Scientific Unions as his culmination point – a three decades long most impressive climb – a storybook career of highest possible level! And as a kind of rounding off of his scientific profile he was appointed as President of the International League of Humanists in Sarajevo and in parallel Director General of the Inter-University Centre in Dubrovnik, positions which he was holding until 2006.

Some colleagues were wondering, if his series of exceptional and ever increasing international positions could be logically followed by comparable local positions within the university. As a consequence Helmut Moritz had been invited several times to become

Dean of the University. All these invitations were rejected by him, thankfully and immediately with the argument that he prefers foreign politics over the handling of interior affairs. In his consequent way he always remembered the recommendation of Euripides: „*You are saying that the throne is attractive? For a wise man not at all!*“ (The author of this obituary can - from his own experience - very well understand Helmut Moritz' firm position in this matter: it is very wise indeed. Think how much theoretical geodesy would have missed with Helmut Moritz as a Dean, let away as a University President!)

Without any doubts Helmut Moritz was a scientific genius. But his scientific talent was also balanced by another outstanding talent; languages. To have a reasonable command of Greek and Latin as a student at a humanistic high school was considered quite normal at that time, and English was usually considered to be learned „on the job“. But in the course of his life Helmut Moritz made it to as many as 14 (!) languages, which he practiced regularly by conversation with native speakers – hard to believe, but true!. And during the last years of his long life he has even studied Hebrew and Arabic – for reasons of curiosity, as he argued!

Particularly gifted scientists often develop a personal inclination to music and literature. This is also true for Helmut Moritz: playing piano was his hobby already as a high school student and remained so for all his life. He particularly loved the weekly „training sessions“ with Sir Prof. Karl Haidmayer, a composer with international profile and a good friend of Helmut Moritz. Inspired by W.A. Mozart, who considered an organ as the „queen of all instruments“, Helmut Moritz took up this challenge and learned to play organ. Quite often one could listen him playing organ in his community church. Helmut Moritz was also particularly well-versed in literature. His interests were equally broad as they were deep-going. But it is was particularly Adalbert Stifter, who was most appreciated by him.

It goes without saying that a career of highest level combined with such an impressive dimension cannot remain unnoticed. As a consequence, Helmut Moritz became a strongly requested person, honoured by top international recognitions and awards: the Gauß-Medal, the Alexander-von-Humboldt-Medal and the Kopernikus-Medal, just to name a few particularly outstanding recognitions among numerous others. Worldwide scientific Academies became very much interested in having Helmut Moritz in their „hall of fame“, and Helmut Moritz contributed scientifically as well as strategically to the academic life of many academies and their development. To make a long story short: Helmut Moritz became member of as many as 15 (!) scientific Academies worldwide.

Three universities with highest international reputation had honored Helmut Moritz with an honorary doctorate for his outstanding scientific achievements in theoretical geodesy: The Technical University Munich, the Ohio State University in Columbus/Ohio and MIIGAIK, the Geodetic University in Moskau. And also the Wuhan University of Technology awarded an honorary professor position to him in recognition of his great scientific achievements and his continuous support of the Chinese geodetic community.

Top-class scientists are often accompanied by particularly sympathetic and supportive partners, and are sometimes even borne by their family. This was absolutely true for his beloved spouse Gerlinde as well as for his daughter Berta and his son Albrecht. Within his extended family, in terms of his co-workers and colleagues, Helmut Moritz found not just admiration, but much more a warm and beneficial embedding which he appreciated and which he very much deserved.

In this way we say goodbye to Helmut Moritz, to an exceptional personality, who was both a particularly gifted scientist and at the same time a very modest person with humor and also with a firm determination - a wonderful friend who was always committed to excellence.

Thank you, Prof. Moritz, for all what you have done for science and for our community at large.

Hans Sünkel

Graz, im Oktober 2022