

## Franz-Ludwig Deubner (1934–2017)

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Franz-Ludwig Deubner passed away on 21 October 2017 in Freiburg, Germany. He had been a member of the Editorial Board of *Solar Physics* and President of International Astronomical Union (IAU) Commission 12 Solar Radiation and Structure. His accomplishments and many contributions to the field of solar physics are well remembered.

Franz was born on 2 June 1934 in Berlin, Germany. His father Alex was a physicist, his mother Louise (née Wegener) a pianist. After graduating from a “Humanistisches Gymnasium”, Franz studied physics and mathematics at the Technical University of Berlin (1953–

1956) and the University of Freiburg (1956–1958), where he received his “Diplom” in 1958. He then joined the scientific staff at the Fraunhofer Institute in Freiburg (since 1978 called the Kiepenheuer Institute), where he built a vector magnetograph for the institute’s Schauinsland observatory (1959–1960). In 1962, K.O. Kiepenheuer started the expansion of the institute’s Capri Station, for which Franz developed a new magnetograph. It was installed at the new domeless Coudé refractor in 1966. Franz not only designed this architecturally remarkable telescope (together with his wife), he also programmed the Siemens control computer of the telescope and magnetograph, a novelty in astronomy at that time. A key component of this magnetograph was the “Doppler-Kompensator”, an electro-mechanical control mechanism that kept the spectral line centered on a pair of photomultipliers, allowing a precise measurement of the linear and circular polarization of the line. The angle of the rotating glass plate of this device provided an excellent measure of the line’s Doppler shift, and Franz began to study the recently discovered solar oscillations in more detail. Franz received his PhD in January 1969, based on data obtained with this instrument.

Probably his most profound contribution to the field of solar physics was his seminal 1975 paper (*Astron. Astrophys.* **44**, 371) in which he demonstrated that the five-minute oscillations are nonradial eigenmodes of the Sun. This publication marked the beginning of helioseismology, a new field in solar physics that grew exponentially in the following decades. In this article, Franz noted that the theoretical predictions of trapped acoustic wave modes made by Roger Ulrich in 1970 agreed with the observed ridges “to an embarrassing extent”, and that such observations are “putting at our disposal an excellent diagnostic tool which allows us to probe the internal structure of our sun”. This landmark article was followed by a three-part series of articles in 1979 together with Roger Ulrich and Ed Rhodes, in which they used the  $p$ -mode oscillations for the first time to measure the solar differential rotation as a function of depth in the solar interior.

Interestingly, Franz had seen the five-minute oscillations in his data while working on his doctoral research at the original Freiburg Observatory at Schauinsland, before Bob Leighton. However, Franz, being the careful observer that he was, could not convince himself that these oscillations were a real solar phenomenon. He attributed them to a periodicity in the spectrograph and therefore never published his Schauinsland results.

In 1979, Franz moved to the University of Würzburg, where he was appointed full professor and Chair of the astronomy department. The change of institute was accompanied by a change of his research focus from “mainstream helioseismology” to high-resolution studies of the dynamics of the solar atmosphere, with a particular emphasis on chromospheric waves. Franz was Dean of the Faculty for Physics and Astronomy from 1991 to 1993 and retired from the University in 1999. He supervised numerous Diploma and PhD students.

Franz enjoyed several long-term sabbatical research visits to the National Solar Observatory at Sacramento Peak, where he was known as the infamous observer who regularly played his cello in the Vacuum Tower Telescope’s turret elevator.

Franz was a true scholar and intellectual, a devoted scientist and renaissance man, highly educated in the humanities, arts, and music. Music, in particular the cello, was his second love. For a long time, he had wavered between studying music or physics, and throughout his life, he regularly played in string quartets with friends and colleagues. He also performed at scientific conferences (*e.g.* at the Soesterberg Solar Surface Magnetism meeting in 1993 with Pierre Mein at the piano and Rob Rutten on the flute). After his retirement, music was his priority. Franz is survived by his twin daughters Maacha and Rachel and three grandchildren.

Bernhard Fleck  
Oskar von der Lühse