

## In memoriam Leon Knopoff 1925 - 2011

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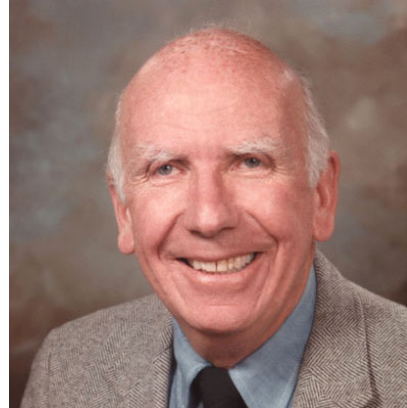
Leon Knopoff passed away on January 20, 2011 at his home in Sherman Oaks, California in the presence of his family from the consequences of lung problems. Age 85, he was up to that time active in several research projects with colleagues and is unfortunately now not able himself to bring these to final conclusions

First he studied electrical engineering at Caltech up to a bachelor's degree and switched then to physics at the same school, where he finished with the Master of Science in 1946 and the PhD in 1949. Subsequently Louis Slichter invited him to the Institute of Geophysics and Planetary Physics (IGPP) at the University of California, Los Angeles (UCLA), where he was promoted to Associate and to Full Professor in 1957 and 1960, respectively. A little later he was named professor of physics at UCLA. In addition, he worked as a research musicologist. He held these positions at UCLA until his retirement in 1995, but continued to work at the IGPP until 2010. He was very much liked as a guest professor and enjoyed it, thus he held such positions successively at Karlsruhe (with Stephan Müller, 1966), Harvard, Chile, Trieste, Cambridge (UK), Venice, Beijing, Strasbourg, repeatedly at several of these universities.

During this time, 38 students successfully finished their dissertations with him. From the whole world (Armenia, Chile, China, Costa Rica, Denmark, Germany, France, Greece, Great Britain, India, Iran, Israel, Italy, Japan, Canada, Mexico, Netherlands, Switzerland, Taiwan, USA, USSR, Vietnam), 40 young scientists came to UCLA to work with Leon Knopoff on the most different questions. The spectrum of his research interests and his original contributions is very, very broad: among others theory of seismic sources, theory of shock waves, equations of state of the Earth's interior, diffraction theory and its application to the scattering of seismic waves by the Earth's core, observation and interpretation of the velocities of seismic surface waves and the inversion of such results to regional differences in the structure of crust and mantle, new approaches to spectral analysis, improvements in the interpretation of free mode observations, attenuation of seismic waves, invention of the spring-mass model which is still used today in many simulations of earthquakes, earth tide measurements at the geographic South Pole, theoretical developments on fracture propagation, different approaches to earthquake statistics, nonlinear dynamics in the context of earthquakes, research in earthquake prediction, development of the thermoluminescence method for dating of archaeological objects, and research in musicology. He is author and coauthor of more than 380 scientific papers and (co-)edited five books. His works most frequently cited now by colleagues concern the theoretical derivation of the equivalence of seismic dislocations with body forces (with R. Burridge: BSSA, 54 (1964), S. 1875) and (also with R. Burridge: BSSA, 57 (1967), S. 341) the "spring-mass"-model for seismicity.

Leon Knopoff himself has often smilingly pointed out that he wrote the papers with the shortest title ("Q", Rev. Geophys. 2 (1964), S. 625), with the shortest abstract "Yes" as answer to the question in the title: "Is the sequence of earthquakes in southern California, with aftershocks removed, Poissonian?" (with J. K. Gardner: BSSA, 64 (1974), S. 1363), and the paper with the probably longest word in the title ("Gruppengeschwindigkeitsmessungen", with Götz Schneider and Stephan Müller: Zeitschrift f. Geophysik, 32 (1966), S. 33). Remarkable to me is the joint publication by two winners of the Emil Wiechert Medal of the DGG (Wielandt & Knopoff, JGR 87 (1982), S. 8631).

Leon Knopoff held many positions. The most important are: secretary general of the International Upper Mantle Project, vice president of the IGPP of the University of California, vice president of the committee for mathematical geophysics of the IUGG, president of the committee for IASPEI, etc.



Not all the honors he earned can be listed here: besides the Emil Wiechert Medal of the DGG (1978) the most important are the Gold Medal of the Royal Astronomical Society (1979) and the Medal of the Seismological Society of America (1990). When he was rewarded with the latter his UCLA-colleague David D. Jackson wrote a very original citation worth reading for him (BSSA 81 (1991), S. 292). On the occasion of his 75th anniversary there was a one day symposium held at UCLA with speakers from many countries (among those two from Germany), and the Royal astronomical Society dedicated issue 143, 2 (2000) of the Geophysical Journal International to him, the "Knopoff Festschrift". The University of Strasbourg elected him 2004 to honorary doctor and in the same year he became the first honorary professor of the Institute of Geophysics of the Chinese Earthquake Administration.

Leon Knopoff had many close international contacts. Besides the USSR, a major role was played by Germany. The latter is certainly founded on the close contact he held to Professor Stephan Müller, former director of the Geophysical Institutes of the University of Karlsruhe and afterwards the ETH Zürich. Stephan Müller invited him 1966 as a guest professor to the Geophysical Institute at Karlsruhe, newly founded in 1964. Twenty of Knopoff's publications have German coauthors. Because of his great overview and his didactic elegance, his seminars were always something very special, and no institute did miss the opportunity for these when he happened to be in the vicinity. The participants then often traveled large distances to hear him and to learn new things. I remember well one lecture in Karlsruhe to which colleagues from Stuttgart and Frankfurt especially traveled.

I had the luck to come in close contact with Leon Knopoff and later also to his family due to my stay in Antarctica for UCLA. Stephan Müller had made the connection to the IGPP. When it turned out that Leon Knopoff enjoyed being in the mountains just as I did, the basis for several meetings in the Alps was established. Thus he, his wife Joanne, and myself met in the Zillertaler Alpen, the Wallis, and in the region of the Montblanc on three occasions and did several more or less strenuous hikes. Besides that, there were several visits and stays at the Schiltach Observatory (up to four weeks). Thus I could spend appreciable time with Leon Knopoff and these are unforgettable and insightful days for me. It was always very impressive to hear stories from the whole world and to learn something new out of an almost unlimited memory. The memories were often reported very humorously. The (not only scientific) curiosity of the Knopoff family was also always very impressive to me. The friendship and collegial connection to Leon Knopoff will be very much missed by me (and many others).

Leon is survived by his wife Joanne as well as the children Katie, Rachel, and Michael, and by a grandson, and they have the cordial compassion of many colleagues and friends.

*Translated by the author*