

Dietrich Lehmann, 1929–2014

We regret to announce the passing of our esteemed colleague, mentor and friend Dietrich Lehmann on June 16, 2014. He filled his 85 years with a passion and determination that could have continued for many, many more.

Dietrich Lehmann was a pioneer of EEG mapping. What is today elaborately termed high-density EEG or electrical neuroimaging, he had already implemented over 40 years ago. He was decades ahead of his time and had a hard time convincing a community focused on EEG waveform analysis about the views and methods he had developed that turned out to be state-of-the-art thinking in 2014. In 1969—45 years ago—he published, together with Derek Fender, a case report in the journal *Electroencephalography and Clinical Neurophysiology* where dipole source analysis was applied to averaged 48-channel visual evoked potentials on a patient with a split chiasm. Two years later, in 1971, he published the seminal paper entitled “Topography of spontaneous alpha EEG fields in humans” in the same journal that ultimately established the term EEG topography and paved the way for innovative spatial analyses of the electric field at the scalp.

Dietrich Lehmann was born on December 3, 1929 close to Heidelberg, Germany, where he completed his medical studies and received the MD degree in 1957. After internships in neurology in Heidelberg, Munich, Freiburg, and Marseille, he moved to California in 1963. He began as a research fellow at the University of California Los Angeles (UCLA), moved as senior researcher to the Californian Institute of Technology (CalTech), and finally became associate professor and acting chairman of the Department of Visual Science at the University of the Pacific in San Francisco, California. Papers from this period on sleep and somnambulism (*Nature*), visual perception (*Science*), and evoked as well as spontaneous field topography (*Electroencephalography and Clinical Neurophysiology*) already document not only his large impact and broad range of interests, but also the emerging focus of his EEG work on spatial analysis. In 1971 he accepted the appointment to the Department of Neurology at the University Hospital in Zurich, where he became Professor for Clinical Neurophysiology in 1988. He retired in 1997, but not before founding, in 1995, the KEY Institute for Brain-Mind Research at the University Hospital of Psychiatry in Zurich, where he remained scientific director until his death.

Besides his unremitting dedication to the spatial analysis of the EEG, Dietrich’s scientific interest focused on the ongoing fluctuation of the spontaneous neuronal activity of the human brain, its relation to daydreaming, its influence on perception, and its modulation in psychiatric diseases. He discovered that the spontaneous EEG as well as event-related potentials could be divided into continuous segments of stable spatial configurations of the electric field. He named these segments “functional microstates”, many years before the imaging community invented the terms “resting states” and “task states.” He proposed that these spatially stationary microstates might be the basic building blocks of information processing, possibly reflecting the time for consciousness—the “atoms of thought”. Many studies have examined (and continue to examine) the significance of these microstates and their modification in different diseases. Dietrich’s own work demonstrated microstate modulations in schizophrenia and during sleep, hypnosis, and meditation, reflecting altered states of consciousness, which he found endlessly fascinating. The functional significance of microstates is still a hot topic and the subject of intense research.

Dietrich Lehmann was a fascinating personality with an insatiable and far-reaching thirst for knowledge and truth. He would discuss the ins and outs of theories of a biological basis of consciousness with the

same insistence as he would argue about the proper seating of a subject in an experiment. He tirelessly fought for what he was convinced to be right and challenged those who presented, in his view, arguments that lacked a solid foundation, either in what was assumed to be true, or in what was to be considered as a-priori impossible, often supported by his sharp humor and skillful drawings. At the same time, he was as free and unorthodox about the hypotheses he considered worth pursuing as he was obsessed with methodological rigor and in-depth understanding of his own research. When publishing with him, reviewer comments were regularly far less challenging than Dietrich's restless quest for perfection.

Dietrich was not a man for small-talk, and he did not like superficial people. For most who knew him, he was not only the inspiring true scientist, but also a kind, modest, resourceful, and compassionate friend or mentor. His desire to understand the brain signals that he recorded did not diminish over the years. On the contrary, one of the last things he said to his wife and long-term scientific collaborator Martha Koukkou-Lehmann was, "It is too early. There is still so much to do in science."

We wish to express our deepest condolences to Martha and to their daughters Phedra and Thalia, Dietrich's son Marco, and the rest of the family. We will treasure Dietrich Lehmann in our memories forever.

Christoph M. Michel, Geneva, Switzerland

Daniel Brandeis, Zürich, Switzerland and Mannheim, Germany

Herbert Witte, Jena, Germany

Jiri Wackermann, Freiburg, Germany

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Roberto Pascual-Marqui, Osaka, Japan

Thomas König, Bern, Switzerland

Toshihiko Kinoshita, Osaka, Japan

Werner Strik, Bern, Switzerland

Wolfgang Skrandies, Giessen, Germany

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