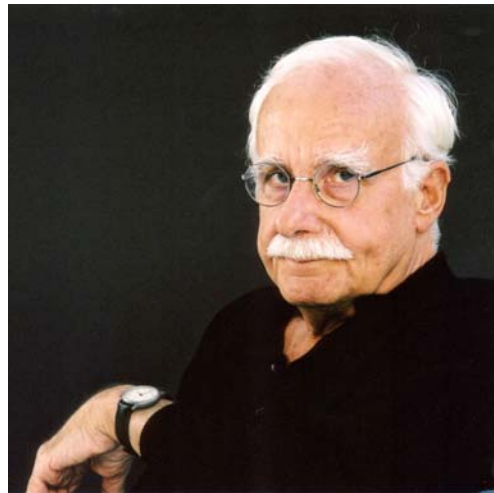


Obituary

Bernhard Mühlischlegel, 1925–2007



Professor Dr. rer. nat. Bernhard Mühlischlegel, emeritus professor of theoretical physics at the University of Cologne and Editor in Chief of *Annalen der Physik* from 1992 to early 1998, passed away on July 18, 2007, at the age of 81 years. His contributions to theoretical physics, his efforts for the scientific community and his commitment to *Annalen der Physik* will always be remembered.

Despite the sadness of losing him, I remember with happiness that Bernhard Mühlischlegel was in very good spirits when his 80th birthday was celebrated with a special colloquium on November 4, 2005, at the University of Cologne. Unbeknown to me then, it was to be my last meeting with Bernhard – and I was proud to be able to present to him a Special Issue of *Annalen der Physik* (AdP), dedicated to him and his scientific work, with contributions from his students, collaborators and friends (AdP **14** [resp. **517**], issue 9-10, 2005).

In the spring of 1991, the then responsible member of the Executive Board of the German Physical Society (DPG), Ingo Peschel, had established contact with Bernhard Mühlischlegel when a new Editor in Chief was sought. In the Editorial for this Special Issue, Ingo Peschel wrote:

“This issue of *Annalen der Physik* [**14**, issue 9-10, 2005] is dedicated to Bernhard Mühlischlegel on the occasion of his 80th birthday. He was born in Berlin on September 13, 1925, where he completed his PhD in 1953 at the Humboldt University, eventually becoming postdoc in Heidelberg and Munich, where he worked with H. Koppe on the new BCS theory of superconductivity. He spent two years in Urbana (USA), before becoming in 1962 a full professor at Cologne University, which he developed into a centre for theoretical physics. He also played a major role in building up a modern theoretical solid state physics in Germany. For many years he was a main referee for the German Science Council (DFG) and he contributed significantly to the journals *Solid State Communications* and *Physics Reports*. He became an emeritus professor in 1990. [...]

Bernhard Mühlischlegel devoted a great amount of energy to the *Annalen*. His goal was a small but excellent journal, which nevertheless covered all areas of physics. Through letters to colleagues, personal contacts and the initial help of the DPG, he succeeded in acquiring a completely new circle of authors. Glancing at the publications during his six year assignment one finds contributions, not only from his contacts in Cologne, but also from many well-known authors, most of them theoretical, but also some experimental physicists. In experimental topics he was supported mainly by K. Dransfeld. The 60th birthdays of W. Eisenmenger and P. Fulde in 1995 and 1996

respectively, brought quite a few additional papers, increasing the impact factor from 0.3 to 1.4. [¹] Business was nevertheless not easy. In those years the drive to publish in *Physical Review* was, if anything, stronger, which also led to the union of *Zeitschrift für Physik* and *Journal de Physique*. By the time Bernhard Mühlischlegel retired from office, the situation had again become more difficult, which led to an attempt to load the work on several shoulders. But it was his commitment which, early in 1998 – when the ownership changed as well, and the position of the DPG was uncertain – led to the journal finding sufficient support among colleagues to give it new impulse. All those involved therefore owe him sincere thanks.”

Bernhard Mühlischlegel began his scientific activities in 1950 with a “measurement of light absorption by micro-crystalline powders”, an experimental study supplemented by theoretical considerations, which became his diploma thesis and was published a few months later.² In his PhD thesis, completed in 1953 and published in 1956,³ he developed the idea of local equilibrium for the calculation of charge and heat transport in metals on the basis of the Boltzmann equation. He noted:⁴ “After completion of my PhD work, I did not study this topic again. I believe the publication has not found any resonance in the literature. However, I was pleased to see that some time later heat conductivity was illustrated very similarly in Ziman’s book *Electrons and Phonons*.”

In subsequent years, Bernhard devoted considerable efforts to the theory of superconductivity, including ground state and thermodynamic properties;⁵ in this context, he utilized, for example, path integral methods as early as 1962. After brief detours to the Ising, the Anderson and the Kondo model, around 1970 he turned his attention to small metal particles. In two remarkable articles, co-authored by R. Denton and D. J. Scalapino, the electronic properties of small normal⁶ and superconducting⁷ metal particles were discussed with impressive foresight, with the “special aim to encourage experimental comparison”. It is worth noting that these papers appeared well before the term “mesoscopic physics” became fashionable! Other topics in mesoscopic physics, like one-dimensional metallic systems, high-frequency response of small tunnel junctions, phase coherence in granular superconductors, and the interaction of sound with Josephson phases were on his agenda in the following years. Once in a while he returned to studies of intermediate valence compounds. More recently, Bernhard developed a strong interest in the question of persistent currents in small normal-metal rings, as well as in the interplay of electronic correlations and magnetism in small clusters.

Bernhard Mühlischlegel’s collaborators include the following colleagues (roughly in chronological order): H. Koppe, B. Blake, J. Zittartz, R. Denton, D. J. Scalapino, N. Grewe, H. J.

¹ Bernhard Mühlischlegel would have been pleased to learn that the *Annalen* impact factor, which has been around 1.13 during the past four years (2002–2005), rose again to 1.431 in 2006 – which we attribute, inter alia, to our efforts during the Einstein year 2005.

² B. Mühlischlegel, *Zur Messung der Lichtabsorption an mikrokristallinen Pulvern*, *Annalen der Physik* **9** [444], 29–39 (1951).

³ B. Mühlischlegel, *Beitrag zur Leitfähigkeitstheorie der Metalle bei tiefen Temperaturen*, *Annalen der Physik* **17** [452], 199–213 (1956). Unfortunately this item is missing in the ISI WoS data base.

⁴ B. Mühlischlegel, *50 years ago: doctoral thesis at Humboldt University Berlin and the environment at the time*, private notes.

⁵ B. Mühlischlegel, *Die thermodynamischen Funktionen des Supraleiters*, *Zeitschrift für Physik* **155**, 313 (1959). This seminal paper has been cited more than 500 times.

⁶ R. Denton, B. Mühlischlegel, and D. J. Scalapino, *Electronic heat capacity and susceptibility of small metal particles*, *Phys. Rev. Lett.* **26**, 707 (1971).

⁷ B. Mühlischlegel, D. J. Scalapino, and R. Denton, *Thermodynamic properties of small superconducting particles*, *Phys. Rev. B* **6**, 1767 (1972).

Leder, D. Hone, R. W. Rendell, P. Entel, Y. Ono, W. Wiethege, D. L. Mills, P. Fazekas, M. Schröter, M. Matschke, A. P. Kampf, P. Marquardt, G. Nimtz, R. Nemeth, K. Frahm, O. Entin-Wohlman, A. Ceccatto, S. Doniach, B. Nathanson, G. M. Pastor, and R. Hirsch.

Bernhard Mühlshlegel was an impressive personality, a scholar in the best sense of the word, with a broad overview of solid state physics and a clear-sighted mind. His openness, his friendliness and his humor impressed everybody who had the good fortune to meet him. His impact on students and young colleagues has been considerable and enduring. His commitment to *Annalen der Physik* has been decisive in ensuring the continuation of the journal in most difficult times.⁸

I first met Bernhard Mühlshlegel around 1977 when he visited his good friend Albert Schmid, my mentor, in Karlsruhe. The event had a lasting impression; in fact it was also this meeting which inspired me to answer his appeal⁹ when a new editorial board for the journal was sought.

Bernhard, we miss you very much and we will always have fond memories of you.

Augsburg, August 2, 2007



Ulrich Eckern
Editor in Chief

⁸ Late in 1998 (as far as I recall), Bernhard Mühlshlegel summarized his personal recollections of the years 1991–1998, i.e., when he was Editor in Chief. We intend to publish a translation of these notes in one of the forthcoming issues.

⁹ Bernhard Mühlshlegel sent an e-mail on December 3, 1997, to about 50 theoretical physicists in Germany, asking for support for *Annalen der Physik*.