

# SPG Mitteilungen Communications de la SSP

**Auszug - Extrait**

## **Editorial**

**Quantum Concept and its Reception in Modern Arts**

*Bernhard Braunecker*

# Editorial

## Quantum Concept and its Reception in Modern Arts

Bernhard Braunecker

Unesco's IYQ 2025 is mainly intended to show the world that the concept of quantum physics has become established in many other scientific disciplines as for example in modern life science. This led with the advent of digital supercomputers to major scientific breakthroughs such as the synthesis of proteins by combining modeling data of molecular interactions at the quantum level with experimental protein sequence data (see Nobel Prize in Chemistry 2024, p. 20). The method will allow a wide range of applications as, e.g., to efficiently design and produce pharmaceuticals *ad personam* at reasonable costs.

It is therefore one of the intentions of our joint SPS / ÖPG annual meeting 2025 in Vienna, to remember with gratitude two main protagonists of quantum science, the Austrians Wolfgang Pauli and Erwin Schrödinger, who were also teaching in Zürich for part of their careers, in a special IYQ symposium on 18 August 2025.

The contact to our Austrian colleagues shall allow us to also look to areas, where the new physics of relativity and quantum theory in the 1920-years had impact, which are philosophy and arts, especially literature and music of the 20<sup>th</sup> century. In a former article<sup>1</sup> we already made aware that the new physical conceptions stimulated important writers such as Robert Musil, Alfred Döblin, Arthur Schnitzler and Hugo von Hofmannsthal. They replaced in their work the classic chronological and more or less predictable course of action

<sup>1</sup> SPG Mitteilungen Nr. 55, July 2018, p. 50, [https://sps.ch/de/articles/physics\\_and\\_society](https://sps.ch/de/articles/physics_and_society)



Pierre Boulez, Bruno Maderna and Karlheinz Stockhausen in Darmstadt in the 1950s. Photo by Hans Kenner. Source: Massimo Mila, "Maderna musicista europeo", cit.

by abrupt montages, collage-like quotations and stochastic arranged flashbacks. A similar paradigmatic change is hinted at in the music of that time, when the concept of Dodecaphony was introduced by Arnold Schönberg and worked out in the *Neue Wiener Schule* together with Alban Berg and Anton Webern<sup>2</sup>. Their early work culminated in the second half of the 20<sup>th</sup> century in the *Musique serielle* with the aleatoric and often electronic compositions of Pierre Boulez, Bruno Maderna, Karlheinz Stockhausen and Luigi Nono.

The question arises whether the almost simultaneous developments in science, philosophy and art had a common origin? A possible candidate could be the philosopher and physicist Ernst Mach, who was appointed to the chair of philosophy at the University of Vienna in 1895, which Ludwig Boltzmann took over 1902<sup>3</sup>. In just a few years, Mach succeeded in attracting and fostering many scientific and literary talents beyond Vienna, such as Robert Musil (Novel: 'The Man without Qualities') who explicitly referred to Mach's philosophy in the introduction to his dissertation in 1908. Mach's successor Adolph Stöhr was followed from 1922 by the epistemologist Moritz Schlick, who is regarded as the founder of the famous *Wiener Kreis*<sup>4</sup>, to which important personalities such as Rudolf Carnap and Kurt Gödel belonged, but who also cultivated contacts with Ludwig Wittgenstein and Karl Popper. The extent of Mach's influence can be seen in the words of Karl Popper: "... only few men had such a great influence on the intellectual development in physics and philosophy of the 20<sup>th</sup> century as Ernst Mach. He influenced Albert Einstein, Niels Bohr, Werner Heisenberg, William James and Bertrand Russell - to name but a few."

The epochal work of the *Wiener Kreis* and the *Wiener Schule* came to an end with the rise of the Nazi-terror since 1933, a sad analogy to the expulsion of Jewish physicists from occupied Europe. But ignorance and terror could not prevent that science as a whole blossomed into those fascinating discoveries in physics, findings in philosophy and master works in arts which we experience and enjoy today.

<sup>2</sup> [https://de.wikipedia.org/wiki/Wiener\\_Schule\\_\(Moderne\)](https://de.wikipedia.org/wiki/Wiener_Schule_(Moderne))

<sup>3</sup> Karl Sigmund "Sie nannten sich Der Wiener Kreis, Exaktes Denken am Rand des Untergangs", Springer Spektrum 2015, (ISBN 978-3-658-08534-6)

<sup>4</sup> <https://geschichte.univie.ac.at/de/artikel/der-wiener-kreis>