“Why should we care about the history of the quantum”

Jaume Navarro
Ikerbasque Research Professor, University of the Basque Country

Maó, 16 October 2025

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Euskadi abre una nueva era tecnológica con la inauguración del superordenador cuántico de IBM en Donostia

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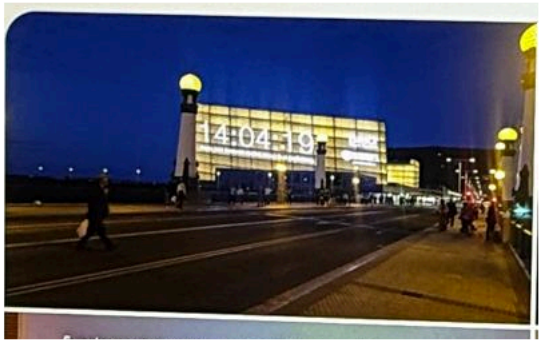
Ver 29 fotos

Inauguración del superordenador cuántico de IBM en Donostia Lobo Altuna



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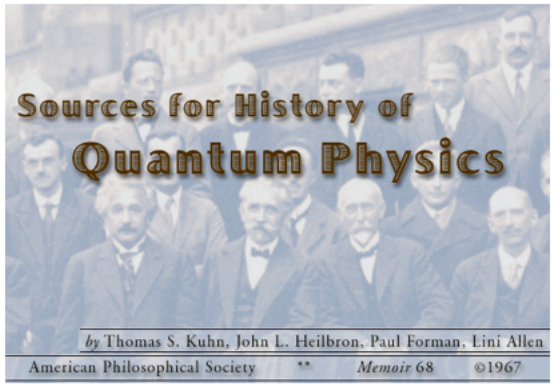

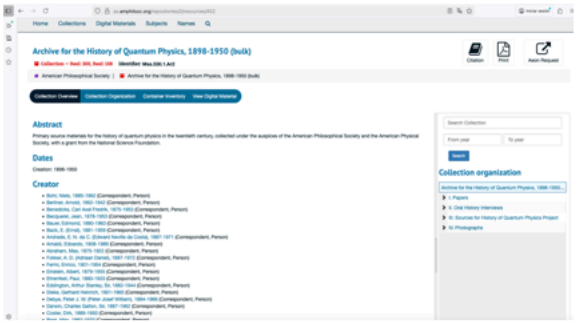

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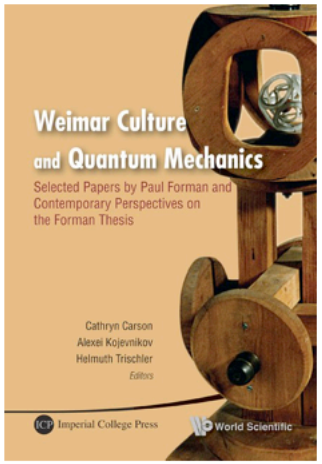

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The Primacy of Science in Modernity, of Technology in Postmodernity, and of Ideology in the History of Technology

Paul Forman

The abrupt reversal of culturally ascribed primacy in the science-technology relationship—namely, from the primacy of science relative to technology prior to circa 1980, to the primacy of technology relative to science since about that date—is proposed as a demarcator of postmodernity from modernity: modernity is when 'science' could, and often did, denote technology too; postmodernity is when science is subsumed under technology. In support of that demarcation criterion, I evidence the breadth and strength of modernity's presupposition of the primacy of science to and for technology by showing its preposterous hold upon social theorists—Marx, Veblen, Dewey—whose principles logically required the reverse, viz. the primacy of practice; upon 19th and 20th century engineers and industrialists, social actors whose practical interests likewise required the reverse; and upon the principal theorizers in the 1970s of the role of science in late 20th century technology and society. The reversal in primacy between science and technology ca 1980 came too unexpectedly, too quickly, and, above all, too unreflectively to have resulted from the weight of evidence or the force of logic. Rather, it was a concomitant of the onset of postmodernity. Oddly, historians of technology have remained almost wholly unacknowledging of postmodernity's epochal elevation of the cultural standing of the subject of their studies, and, specifically, have ignored technology's elevation relative to science. This I attribute to the ideological character of that discipline, and, specifically, to its strategy of ignoration of science.

Keywords: Technology as Applied Science; Science as Technology; Revolts Against Science; Modern; Postmodern; Heidegger; Marx; Sombart; Bukharin; Veblen; Dewey; Mumford; Lenoxians; Daniel Bell; Lyotard; Erlanger Schule; Starnberger Schule; Finalization; Romanticism; Lebensphilosophie; Technological Determinism

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Historians of quantum physics and early quantum mechanics have seldom paid attention to the ways the new theory was integrated in physics textbooks, perhaps taking for granted that novelties in science can only be taught once they are fully understood and generally accepted. The essays in this volume challenge this view by studying some of the early books and textbooks in which quantum theory was first introduced. By so doing, the authors show the many ways books and textbooks embody pedagogical and research practices in certain local environments (geographical, disciplinary, in terms of expertise, etc.), as well as the circular feedback between research and pedagogy.

Textbooks can become the subject of a history of early quantum physics since the very process of writing a textbook, i.e., of trying to organise a new doctrine to the newcomer in an accessible way), together with its life as an object that is tested, used, changed, and abandoned, incorporates many of the tensions between research and pedagogy. Furthermore, the life of these books can also help us better situate less known actors in the history of quantum physics, by bringing into the picture the reasons, the context, the research agenda, and other aspects that cannot be found in the publication of research papers or in the abundant correspondence between the main physicists involved in this story.

The case studies collected in this volume may, at first glance, look like a heterogeneous set. Some books were not, in fact, primarily addressing quantum theory as such, but including some of its early principles in re-shaping the established foundational principles and modes of teaching in fields such as optics and physical chemistry. Others were written by scientists not directly involved in the development of the new physics, and their books were addressed at an audience interested in having only a superficial knowledge of the theory of quanta. Finally, the main actors in the formulation of quantum theory wrote books on the quantum for different purposes: as a way to organise their thoughts, to spread a particular interpretation of the theory, or to press for their personal research agendas, among others. This heterogeneity is, however, the tool the editors use to give a full picture of the role of early textbooks in the history of quantum physics.

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Research and Pedagogy

A History of Quantum Physics through Its Textbooks

Massimiliano Badino and Jaume Navarro (eds.)

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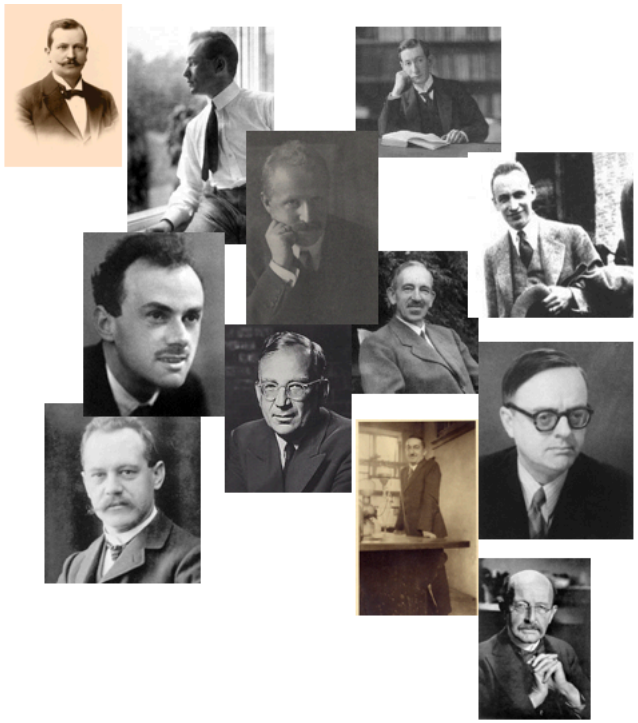

Some (interesting?) ideas

✓Research agendas
✓Pedagogical agendas
✓Theory in flux vs established science
✓The broad notion of “popularisation”
✓The diversity of “actors”
✓The local contexts
✓Exploring the borders: the migration of the quantum
✓“Revolution” is not a helpful category

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