

18th Symposium of the History of Physics Division
at the Spring Meeting of the German Physical Society

Munich, 18–20 March 2019

“The Tools of Physics”

Telescopes, particle accelerators, thermometers, but also Fourier series, measurement units and computer programs: Physicists have developed and employ many tools which are (not only) today essential components of their practices.

Over the last decades, historians of science have become increasingly sensitive to the material and performative dimensions of scientific endeavors, and to the fact that scientific knowledge is no abstract content, but is deeply intertwined with the instruments, codes, and procedures employed to produce, communicate, and apply it. Scientific instruments as well as other tools of the scientific trade are not simply “reified theorems” (Bachelard 1933), but have a life of their own, which has often shaped not only specific scientific experiments, but also larger conceptual frameworks. Indeed, in modern physics there are many notions that are constitutively shaped by the apparatuses which helped “discover” them, e.g., in thermodynamics or electromagnetism.

The construction, diffusion, and use of scientific instruments is in itself a process of knowledge production and communication which has served and serves to connect both different cultural spheres and different cultures. Because of their often highly refined technical features, the tools of scientists—and of physicists in particular—have also at times become symbols of wisdom and power. Consequently, in premodern and early modern times astronomical and mathematical devices like astrolabes or armillary spheres were gifts fit for kings. Yet not only the devices which we regard as proper scientific instruments are worth our attention, but also more modest tools, such as telescope mounts, simple computational aids, or hand-drawn sketches. Moreover, physicists manipulate not only instruments, but also apparently abstract constructs, such as mathematical notations or computer code, which may therefore display their own specific epistemic dynamics as non-material tools.

Reconstructing how the tools of physics lead a “life of their own” constitutes a challenge, and requires, on the one hand, close cooperation between historians and museum curators and other instrument experts, and on the other hand efforts to provide a thick description of the context in which the tools have been employed. Historically accurate reconstructions of instruments and re-enactments of experiments play a central role in this context, and studies in this direction have brought to light the role of the body of the scientist in experimental practice. Likewise, the interplay between the development of an instrument and the performance with that instrument in aiming at stabilizing the experimental procedures and the knowledge production gave insights into the complexity of laboratory practices. Research on physicists’ tools has also

uncovered new historical actors, the “invisible technicians”. More generally, a focus on tools of scientific practice reveals the entanglement of science with other cultural spheres and its manifold connections to social, economic and political contexts.

Recognizing how material instruments produce and communicate knowledge also helps bridging the gap between theory and practice in the physical sciences, as it contributes to our understanding of how theory, as well, is highly dependent on its own set of tools, like symbolic notation, diagrams, mathematical techniques, and, more recently, computing machines and codes.

We welcome contributions in English or German focusing on these or other aspects of tools in the history of physics, for example on the following themes:

- studies of instruments and their context
- collaborations between historians of science and museum curators
- reconstructions of instruments or experiments
- the roles of tools in shaping physical concepts
- instruments as mediators between cultural spheres and cultures
- possible sources for a history of tools of physics, both those materially extant, and those lost, destroyed or merely imagined
- the tools of physical theory
- scientific instruments and “research technologies”.

Beside sections devoted to the theme laid out above, free sections offer the possibility of presenting current research in all areas of the history of physics. The participation of PhD students to the conference is encouraged and can be financially supported by the WE-Heraeus-Stiftung. Please see the website of the meeting.

The registration to the Meeting is open between October 1st 2018 and December 1st 2018 at <https://muenchen19.dpg-tagungen.de/index.html> Proposals for talks maybe submitted at this webpage as well. When submitting a proposal, please choose the History of Physics Division (Fachverband Geschichte der Physik (GP)). There is no poster session.

For questions please contact:

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Or other members of the Board: Peter Heering (Flensburg), Christian Joas (Kopenhagen) und Dieter Hoffmann (Berlin), or the website of the History of Physics Division:

<https://www.dpg-physik.de/dpg/gliederung/fv/gp/index.html>