

Fachverband Geschichte der Physik (GP)

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18th Symposium of the History of Physics Division “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.

Übersicht der Hauptvorträge und Fachsitzungen

(HS 9)

Plenarvortrag von Martha Lourenco

PV VII Mi 8:30– 9:15 Plenarsaal **Reconciling the past and the present: The shared history of physicists and museums** — ●MARTA C LOURENCO

Hauptvorträge

GP 1.2 Mo 13:15–14:00 HS 9 **Tracing the origins of physics on the Canadian Prairies: Skills, materials, and instruments on the move.** — ●DAVID PANTALONY

GP 5.1 Di 10:45–11:30 HS 9 **A solution to a number of problems: On the development of the laser as a tool for and a subject of physical research** — ●JOHANNES-GEERT HAGMANN

GP 6.1 Di 14:00–14:45 HS 9 **Tools of Physics as Technological Systems: Building Big Telescopes before 1825** — ●RICHARD KREMER

GP 10.1 Mi 11:15–12:00 HS 9 **The computer as a tool of physics: how it all began - or not** — ●ARIANNA BORRELLI

Fachsitzungen

GP 1.1–1.2 Mo 13:00–14:00 HS 9 **Conference Opening**

GP 2.1–2.4 Mo 14:00–16:30 HS 9 **The tools of physics between, research, teaching and public outreach**

GP 3.1–3.4 Mo 16:30–18:30 HS 9 **Physicists and their instruments**

GP 4.1–4.2 Di 9:15–10:45 HS 9 **Open Topic**

GP 5.1–5.4 Di 10:45–14:00 HS 9 **Instruments as tools and subjects of research**

GP 6.1–6.4 Di 14:00–16:30 HS 9 **Tools and Technologies of physics research**

GP 7.1–7.4 Di 16:30–18:30 HS 9 **The tools of physics and their replication**

GP 8 Di 18:30–20:00 HS 9 **Mitgliederversammlung des Fachverbandes Geschichte der Physik**

GP 9.1–9.2 Mi 10:00–11:15 HS 9 **Understanding tools from the distant past**

GP 10.1–10.3 Mi 11:15–14:00 HS 9 **Understanding tools from the recent past**

GP 11.1–11.4 Mi 14:00–16:30 HS 9 **The tools of physical theory**

GP 12.1–12.4 Mi 16:30–18:30 HS 9 **Technological development of tools of physics**

Mitgliederversammlung Fachverband Geschichte der Physik

Dienstag, 19. März 2019 18:30–20:00 HS 9

Exkursion: Deutsches Museum München

Donnerstag, 21. März 2019 10:00–12:00

Treffpunkt: Eingangshalle Bibliothek Deutsches Museum, Museumsinsel 1.

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