

“Weak” and “Strong” Knowledge

in Solid State Physics and Materials Science

Workshop at the SFB 1095 “Discourses of Weakness and Resource Regimes”

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Some researchers have introduced the “disunity of science” as a counter-model to an understanding of science emphasizing the unified, the homogeneous, or the pure. For many scholars, these concepts still characterize central aims of scientific endeavor in general, and of scientific practices leading to “strong” forms of knowledge (e.g. epistemically or institutionally strong) in particular. In an attempt to invert the traditional perspective of looking at scientific knowledge as a “strong” social or cultural resource, this conference aims at exploring ascriptions of “weakness” to knowledge. In our understanding, the emergence and development of solid state physics and materials science can serve as a good example for the important role played by “weak” knowledge in the development of 20th century science. Thus, we are not only aiming at investigating the transformation of (ascribed) “weak” into (ascribed) “strong” forms of knowledge; we are also interested in attempts to handle or compensate for identified weaknesses and in the role “discourses of weakness” played in the identification and mobilization of new resources and the initiation of change.

The conference team is part of a broad cooperative research project funded by the German Research Foundation, which includes historians of all periods, ethnologists, sinologists, historians of law, and philosophers. The researchers of the Collaborative Research Centre (SFB) “Discourses of Weakness and Resource Regimes” at Goethe- University are dedicated to exploring the changes of social and cultural formations (contemporary or historical) by investigating how the indication of weakness contributes to the transformation of the ways in which societies organize (create, mobilize, allocate, or repurpose) their resources. For example, the focus of one research project is the development and exploitation of materials as resources in the context of the former German Democratic Republic of Germany (East-Germany) as a resource-weak state under the conditions of the Cold War.

Effective or ascribed “weakness” plays a role in the history of materials science on various levels. Materials science emerged in an inter-disciplinary environment urging physicists for example to accept scientific practices and methodologies, which in their understanding weakened their scientific standing. In many cases, the researchers were not equipped with adequate institutional support for their research or the education of specialized researchers and technicians. The research practices and results were considered as epistemically weak due

to the ascribed inadequacy of the applied theories or the choice of research objects (e.g. “impure” or compound materials); and they were deemed to be socially or culturally weak because as representatives of an “impure science”, they did not earn (at least from the physicists’ point of view) as much public attention and gain as much credit as their colleagues in other fields of the physical sciences. How did new practices, new objects of research and new institutions influence the way science and research was perceived? How did political and public expectations contribute to the shaping of new fields of study, and how did scientists foster and influence the development of these expectations?

The aims of the conference are threefold: To discuss 1) the place of “weakness” and “weak” forms of knowledge and knowledge-production in solid state physics and materials science, 2) the ways researchers were dealing with the shortcomings and resistances they experienced in their field of study (for example attempts to collectively compensate for individual weaknesses by merging competences from various fields of study), and 3) the processes which allowed to transform “weakness” into “strength”. One result of investigating these transformation processes could be the identification of “discourses of weakness” as a precondition for the installation of new approaches and styles of scientific research.

We would be interested in contributions that deal with the development of methods and instruments, or the installation of model substances in materials science, as well as the attempts to defend and increase the credibility of new scientific practices – e.g. by way of professionalization (such as the founding of journals) or new forms of organizing and institutionalizing research. How were these fields of study strengthened and transformed by connecting their practices to (expected or promised) applications – in particular the provision of new materials and new understandings of (material as well as social) order?

To complement our own research, we would welcome contributions dealing with the developments in other former socialist states, or the ideological discussions on the character and relevance of solid state physics and materials science, as well as the contributions to the resource regimes of these states. How is the rise of materials science connected to the development of a specific “cold war rationality”?

Finally, we would like to discuss the “weaknesses” of the historiographical approaches and analytical tools that we apply in studying the history of solid state physics and materials science.