Embarking on an artifact-based study, the scholar presented with a scientific object engages with it in a very different manner that she would with textual resources such as published books and papers, notebooks, letters, or lab memos. Interacting with the very materiality of the objects allows the scholar to experience new dimensions of the artifacts history, presence, and use. Underpinning this intimacy is the idea that scientific objects are bearers of meaning, although not necessarily (and never exclusively) textual. Objects impress us, and interacting with them opens up a silent repository of tacit knowledge and embodied perception that only material engagement can access. Thus, a central concern for the study of scientific objects has been to devise and to clarify different modes of engagement with scientific objects, in order to extract, interpret, and situate the knowledge scientific objects bring with them. A first-hand engagement with the objects can also disclose their affordances for action and the cognitive strategies required for their use, thus offering a very different window into the mind of their designers and past users than textual sources can.

The aim of this course is to develop the student’s critical thinking concerning the historical, philosophical, cognitive, and sociological study of scientific objects. We will address three main philosophical questions concerning scientific instruments:

1. What does it mean for scientific instruments to be bearers of knowledge?
2. How should we study the knowledge embodied in the scientific instruments?
3. What can we learn from studying these objects, and can we learn something that textual resources fail to convey alone?

We will try to answer these questions by examining different approaches offered to understand the role and epistemic importance of scientific instruments as bearers of material knowledge, and examine the role of such objects in shaping the social dimension of science. Moreover, the course aims to offer an interdisciplinary approach to these questions by encompassing developments in the history, philosophy, and sociology of science and technology, and to integrate relevant developments from other disciplines, such as anthropology, archaeology, cognitive science, and museum studies.

The course has two primary goals: 1) acquiring the skills needed to understand and critically assess the relevant texts as well as to formulate and present one’s own arguments and views on the subject-matter and 2) acquiring knowledge of the issues, positions and arguments.

Assignments

Participation to seminar (20%): Each week, the student is expected to have read the mandatory texts and participate in the discussion. The student must also identify two questions related to the obligatory text and/or its relationship to the problematic of the seminar. The participant will also introduce one of the texts in the supplementary readings list. The presentation (around 15-20 minutes) will be followed by a general discussion of the mandatory readings.
Essay (80%): The student will produce an essay (2500 words max) discussing one the papers addressed in the seminar (mandatory or supplementary). The student is free to choses the topic. The topic needs to be approved through a 250 words abstract, at least two weeks before the last class.

Calendar and readings

Introduction (2 weeks)

Week 1 – Problems in the epistemology of scientific instruments
  - Introduction to the seminar

Week 2 – Objective knowledge

PART I – Scientific instruments as bearers and producers of knowledge (4 weeks)

Week 4 – Cognitive distribution in the laboratory

Week 5 – Scientific instruments as cognitive augmentations

Week 6 – Thing knowledge I

Week 7 – Thing knowledge II

PART II – The metaphysics of scientific instruments

Week 7 – Instruments as replicas of nature

Week 8 – The theory ladenness and materiality of scientific instruments
PART III – The life of scientific instruments

Week 9 – Studying scientific instruments
- Texts in Focus section: the history of scientific instruments, Isis 2011, 102(4)

Week 10 – The social life of scientific instruments

Week 11 – Experimental history of science

Week 12 – The value-ladenness of scientific instruments
- To be determined

All mandatory texts will be made available on the e-learning site or on hold at the university’s library.