

AGPhil 2: Philosophy of Physics 2

Zeit: Dienstag 9:10–10:25

Raum: VMP6 HS G

Hauptvortrag AGPhil 2.1 Di 9:10 VMP6 HS G
Nineteenth century optics and three tales of success-to-truth inferences — ●MICHELA MASSIMI — Philosophy, University of Edinburgh, Edinburgh EH8 9AD, UK

In philosophy of science, success-to-truth inferences have been the realist stronghold for long time. Scientific success has been the parameter by which realists have claimed to discern true theories from false ones (via the so-called No Miracles Argument). But the notion of scientific success has not been scrutinized as it should.

In this paper, I tell the tale of success-to-truth inferences three times, by considering success from nowhere, success from here now, and success from within. My tale focuses on nineteenth century optics and Augustin Fresnel's lasting contribution.

I ultimately argue for a suitable version of success from within that can do justice to the historically situated nature of scientific knowledge while also delivering on the promise of realism about science. The outcome is a new way of thinking about success-to-truth inferences that can help us re-assess some entrenched views about winners and losers in the history of science.

AGPhil 2.2 Di 9:55 VMP6 HS G
Computer simulations as media of knowledge production in the practice of quantum theory — ●ARIANNA BORRELLI^{1,2}, ANNE

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Computer simulations are today a necessary element of research practices in all branches of physics, and their possible epistemic significance as a (new) form of experiment has been the subject of much philosophical debate. However, computer simulations may also be regarded as a new form of theoretical description of physical phenomena, replacing the conventional mathematics, and as such they might also be seen as a new language (re)shaping the practice of physical-mathematical theorizing, as was the case with algebraic formalisms, infinitesimal calculus or Feynman diagrams. To put it differently: computer simulations are media for knowledge production.

Choosing a bottom up case studies approach including ethnographic methodologies for investigating this hypothesis, the paper takes a closer look both at instances of theorizing in quantum physics in which computer simulations contribute to the formation of concepts and theoretical structures, and at experimental practices that need computer simulations as a guiding means of the apparatus setup. The examples discussed range from the simulations of very simple quantum-mechanical phenomena to the complex micro-systems of lattice QCD.