

Editors' Introduction

Allan FRANKLIN and Slobodan PEROVIC

Received: 08/04/2015
Final Version: 08/04/2015

BIBLID 0495-4548(2015)30:2p.161-162
DOI: 10.1387/theoria.14402

Experiments play essential roles in science. Philosophers of science have emphasized their role in the testing of theories but they also play other important roles. They are, for example, essential in exploring new phenomenological realms and discovering new effects and phenomena. This conference (*Philosophy of Scientific Experimentation* - PSX), the fourth in a series, is intended to explore various philosophically relevant aspects of experiment.

The PSX conference series was conceived and started at the Center for the Philosophy of Science of the University of Pittsburgh. The conferences at Konstanz University, University of Colorado, Boulder, and back in Pittsburgh followed. A diverse group of contributors to the conference series consists of philosophers of science and scientists, including a Nobel Prize winner for experimental physics. The contributors have addressed a very broad range of questions that can be grouped in four main clusters.

The first cluster concerns the relationship between experiment and theory. How is experimental practice organized, around theories or around something else? How independent is experimentation from theories? Does it have a life of its own? Can experiments undermine the threat posed to the objectivity of science by the thesis of theory-ladenness, underdetermination, or the Duhem-Quine thesis?

The second cluster deals with the nature of experimental practice. What are the important similarities and differences between experiments in different sciences? What are the experimental strategies scientists use for making sure that their experiments work correctly? How are phenomena discovered or created in the laboratory? Is experimental knowledge epistemically more secure than observational knowledge?

The third cluster asks whether experiments give us good reasons for belief in theoretical entities. It ties to some of the long-standing debates in philosophy of science, such as the debate between realism and anti-realism.

Finally, the fourth cluster is a result of fairly recent important changes in experimental methodology and the role simulations play in it. It address the following issues: What role do computer simulations play in the assessment of experimental background? How trustworthy are they? Do they warrant the same kind of inferences as experimental knowledge? Are they theory by other means?

In the fourth conference of the series we mostly focused on the question, "What Makes a Good Experiment?" One can distinguish between *conceptually important experiments*, those classified by their relation to theory; testing theory, calling for a new theory etc. and



technically good experiments, those that measure a quantity of scientific interest with greater accuracy and precision than had been done previously. Both types of experiment must be methodologically good, i.e. experiments that give reasoned and valid arguments for the credibility of their results. The papers in this issue explore the ways these challenges are met across sciences, as well as philosophically interesting difficulties that arise in the process.

ALLAN FRANKLIN is professor of physics at the University of Colorado. He works on the history and philosophy of science with emphasis on experiment in twentieth century particle physics. His most recent book is *Shifting Standards: Experiments in Particle Physics in the Twentieth Century*.

ADDRESS: Department of Physics, Campus Box 390, University of Colorado, Boulder CO 80309-0390, USA. E-mail: allan.franklin@colorado.edu

SLOBODAN PEROVIC is an Associate professor at the Department of Philosophy, University of Belgrade, Serbia, and a fellow of the Center for Advanced Studies, University of Rijeka, Croatia. He studies philosophical aspects of early quantum mechanics (see e.g. "Emergence of Complementarity and the Baconian Roots of Niels Bohr's Method," *Studies in History and Philosophy of Modern Physics* 44 (3): 162-173, 2013.), as well as epistemological issues in experimental High Energy Physics ("Missing Experimental Challenges to the Standard Model of Particle Physics", *Studies in History and Philosophy of Modern Physics*, Vol. 42, 32-42, 2011).

ADDRESS: Odeljenje za Filozofiju, Filozofski Fakultet, Čika Ljubina 18-20, 11000 Beograd, Serbia. E-mail: perovic.slobodan@gmail.com