

# HARVARD UNIVERSITY



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To the Dissertation Council of Philosophy Department of Moscow State University.

I have read the synopsis of the dissertation of PhD (Candidate of Sciences) in Philosophy of Science and Technology "Epistemological and Social-Ontological Problems of Contemporary Physics Experiments" submitted to your Council by Vitaly Pronskikh and I strongly recommend awarding him that degree.

In his dissertation Vitaly deals with issues of theory-ladenness and social structure of scientific community in high-energy physics experiments, which are very important issues of philosophy of scientific experimentation. Vitaly's dissertation is close to my research interests. My most important works on these topics are "How Experiments End", "Image and Logic: Material Culture of Microphysics", and "Objectivity". In my books, I engage with the impact of modern technology on what it means to "do" physics and to be a physicist. At the beginning of this century, physics was usually done by a lone researcher who put together experimental apparatus on a benchtop.

Now experiments frequently are larger than a city block, and experimental physicists live very different lives: programming computers, working with industry, coordinating vast teams of scientists and engineers, and playing politics. I probe the material culture of experimental microphysics to reveal how the ever-increasing scale and complexity of apparatus have distanced physicists from the very science that drew them into experimenting, and have fragmented microphysics into different technical traditions much as apparatus have fragmented atoms to get at the fundamental building blocks of matter. At the same time, the necessity for teamwork in operating multimillion-dollar machines has created dynamic "trading zones," where instrument makers, theorists, and experimentalists meet, share knowledge, and coordinate the extraordinarily diverse pieces of the culture of modern microphysics: work, machines, evidence, and argument.

Vitaly in his dissertation deeply engages with the concepts I brought forward in my books as well as ideas of Allan Franklin and Andrew Pickering. He develops a scheme of the high-energy physics community based on my division on theorists, experimentalists, and instrumentalists, which serves in his thesis as a social projection of the theoretical-operational division of experiment into three parts, theory of phenomena, theory of preparation, and theory of measurement proposed by V.A. Fock. Establishing a correspondence between the two initially very different approaches, anthropological and theoretical-operational, is an undoubted achievement of the thesis. Based on this division, Vitaly proposes a heterogeneous scheme in which boundary objects like accelerated protons or data are nested between communities in the scheme, thus separating them. Vitaly argues that those boundary objects serve a means of epistemic division between communities and create epistemic disunity and dependence between members of the scientific community. Vitaly suggests that such division creates epistemic inequality in the community and transforms most part of the community in high-energy physics to non-epistemic one in the sense of theory of phenomena. To overcome that inequality Vitaly proposes to create conditions allowing physicists of different specialties to collaborate across specializations and play different roles during their careers.

The synopsis shows that Vitaly Pronskikh is aware of contemporary discussions in the philosophy of experimentation. He has studied and is aware a large amount of relevant philosophical, historical, and sociological literature. Historical examples chosen by Vitaly are a relevant demonstration of the ideas developed by the author or discussed throughout the synopsis. The topic chosen for dissertation is relevant to contemporary studies in philosophy of science and results obtained are valuable for the field development.

I therefore support awarding Vitaly Pronskikh the sought degree.



COMMONWEALTH OF MASSACHUSETTS  
Peter L. Galison  
personally appeared before me, the undersigned notary public, and  
proved to me his/her identity through satisfactory evidence, which  
were personally known and  
acknowledged he/she signed the foregoing instrument voluntarily  
for its stated purpose on this 10th day of May, 2017.



Daniel Wayne Borchelt  
DANIEL WAYNE BORCHELT, Notary Public  
My Commission Expires March 14, 2019