**A call for applications for post-doctoral fellowships**

We welcome applications for two post-doctoral fellowships in the framework of a research grant from the Israel Science Foundation (ISF) titled: Wide reductive physicalism: classical and quantum aspects (see abstract below).

The fellowships will be granted for one year with a possibility of extension up to 4 years depending on the ISF approval and the following conditions:

The fellows are expected to co-author with the two PIs at least one research paper that will be submitted for publication in a journal in August of the fellowship's year, present their results in an international conference or workshop, and participate in discussions groups led by the PIs. If these conditions will be met, the fellowship can be extended for another year (under the same conditions). The topic of the co-authored paper will be in the framework of the research proposal and will be subject to the approval of the PIs.

In the first year the total sum of the fellowship will be around 40,000 NIS (depending on the actual period of the fellowship). The sum includes travel expenses and health insurance. Applicants should have a PhD at the commencement of the fellowship or in special circumstances should have submitted their PhD thesis to the university. The first year of the fellowship will terminate on 30 September 2026.

Applications should include (1) personal details; (2) curriculum vitae; (3) list of publications, (4) a short abstract of the doctoral thesis; and/or a recent publication; (5) a research proposal related to the topics of the research (as described in the abstract below); (6) one letter of recommendation, sent directly to the PIs.

Applications (no forms are required) should be sent electronically in one PDF format only to: orly.shenker@mail.huji.ac.il ; meir@research.haifa.ac.il .

Applications must be received by 10 November 2025.

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**Abstract: Wide Reductive Physicalism: Classical and Quantum Aspects**

The proposed research is part of an ongoing project, which aims to develop a wide *reductive* physicalist approach towards *all* the special sciences (including psychology and the cognitive sciences) on the basis of a mind-brain identity theory and contemporary fundamental physics (we call it Wide Flat Physicalism; FlatPhys for short). Wide FlatPhys is a widening extension of FlatPhys in which we address questions we didn't hitherto address, which we believe will lead to a breakthrough in philosophy of mind and the cognitive sciences and the philosophy of the special sciences.

The main conjecture of FlatPhys is that everything is *reductively physical* and describable in physical terms (in the same reductive way that entropy and the Second Law of thermodynamics are accounted for in statistical mechanics). We start from results obtained in our previous work concerning the reduction of thermodynamics to mechanics by statistical mechanics (classical and quantum) and the reduction of the laws and kinds of the special sciences to fundamental physics. The research is divided into three major topics:

Topic 1 concerns the role of the *observer* in *classical* statistical mechanics. We proceed by investigating two working hypotheses: the first one is that classical statistical mechanics cannot be considered a complete theory without introducing mental states (i.e., an observer). This hypothesis is based on results we obtained in our approach to the foundations of classical statistical mechanics (which attracted criticism). However, we believe that we can settle down the question in support of our conclusion. To this end, our second working hypothesis is the following: the reduction of thermodynamics to fundamental physics, even in the classical case, is possible if and only if a strict mind-brain identity theory is the case. Given our preliminary results of what reduction and identity mean, this hypothesis implies that reducing thermodynamics to statistical mechanics rules out non-reductive approaches to the mind (e.g., functionalism). This is a surprising result; and it uncovers another unexpected fact: reducing thermodynamics to mechanics, even in the classical case, requires a physical solution to the hard problem of consciousness. This is a clear case in which philosophy intertwines to set the physics straight, and vice versa.

Topic 2 concerns the hard question of how to account for semantics in a reductive physicalist approach. Our main question is the following: in virtue of which *physical* facts can a mental state, which in FlatPhys is a brain state, be *about* some other state of affairs? To answer this question, we investigate two alternative routes. We start by following contemporary causal approaches to reference, which if successful, could be adopted by FlatPhys. Causal approaches are intended to show that causal interactions determine uniquely reference. However, we show that in a physical world this is *impossible* since causal interactions leave the referent of a brain state *indeterminate* while the brain state, which in FlatPhyis is *identical* with mental content, is in fact determined (we call it the problem of individuation of reference by the causal trigger). Causation therefore leaves reference indeterminate, contrary to our experience. We conjecture that this problem is insoluble by a physical (and counterfactual) account of causation. Therefore, as an alternative route we depart from the standard wisdom and develop (what we call) a *denialist* approach. This approach attempts to explain *semantics away* altogether by taking our mental states to be literally *in the "head"; they are not about anything*. A preliminary supporting result is our denialist approach to the so-called *psychological arrow of time*. We showed in a previous research that in a time-symmetric physics the experience of temporal directionality can only be grounded in some *non-temporal in-brain* asymmetry. No other asymmetry (in or outside the brain) can bring about the psychological arrow.

Topic 3 addresses the quantum mechanical version of FlatPhys. Here, the main question is the following. In the face of the measurement problem in quantum mechanics, what are the necessary conditions quantum theories should satisfy in order for them to be candidates for the physical basis of FlatPhys (from which everything is derivable). Our first condition is that the solution to the measurement problem should not presuppose primitive (brute) mental facts. That is, the measurement problem should be solved *before* one introduces an *observer* into the complete theory. Obviously this condition rules out from the start (as is well known) mind-brain dualism (e.g., von Neumann and Wigner). Our first working hypothesis is that an explicit FlatPhys approach as part of physics filters out some other quantum theories (e.g., Chalmers-McQueen) that *prima facie* don't seem to be dualist. Our second hypothesis is that FlatPhys can filter out yet other quantum theories by considering the import of *quantum statistical mechanics*. We conjecture that one can derive a *no-go* theorem in quantum statistical mechanics that will rule out certain quantum theories that seem to pass the first condition.

Finally, our proposed research has a high-risk-high-gain potential. The objective of developing a full blown FlatPhys approach is highly ambitious and addresses pressing open questions in philosophy and the sciences. According to contemporary orthodox wisdom, reductionism is considered *improbable* and in this sense the project is highly risky. But given the substantial number of preliminary results we already have, it seems to us that the chances of success are in fact even higher, and moreover the expected significance has a very high overall gain: we believe that FlatPhys will contribute to the development of a balanced equilibrium in the future of the special sciences and physics in a way similar to the parallel and scientifically fruitful development of thermodynamics and statistical mechanics.