How much philosophy in the philosophy of science? I will show that for probability kinematics (the question how observations change rational probability assessments) the majority view of philosophers can be undermined in favour of the majority view of statistical physicists. At issue is what I am calling the full employment theorem in probability kinematics (FET). It states that in order to reassess a probability distribution in the light of new evidence one needs a trained epistemologist to apply situation-appropriate tools from a wide range of methods in a pluralistically arranged toolbox.

FET may not be false, but, more weakly, the main avenues of argument for FET fail. The converse of FET states that there are formal methods we can successfully apply to all cases in which a probability assessment needs to be adjusted in view of new evidence, without the need for a case-by-case interpretation by an epistemological expert. Advocates of FET usually present counterexamples, predominantly Bas van Fraassen's Judy Benjamin problem (often this will be their only counterexample). It produces under the application of the formal method counterintuitive results. Therefore, so goes the reasoning, the universal claim of the opponents fails and FET stands.

If your observation comes in the form of an event, a plausible way to update your probabilities is by conditioning. If your observation comes in the form of a redistribution of probabilities over a partition of the event space, it's plausible to use Jeffrey conditioning. Observation can be even more general and come in the form of affine constraints (the Judy Benjamin problem is a simple example). If Jeffrey conditioning cannot be applied to an affine constraint, we can use the principle of maximum entropy, based on the intuition that the observation should minimally affect the probabilities without being inconsistent with it. Some say that the principle of maximum entropy delivers the unique solution to this problem fulfilling a set of basic rationality requirements. Advocates of FET believe that the principle of maximum entropy is only one of many different strategies to update probabilities rationally, depending on individual cases. They cite the Judy Benjamin problem to undermine the generality of the principle of maximum entropy.

I will show various ways in which their arguments go awry. The results provided by the principle of maximum entropy for the Judy Benjamin problem are supported, not contradicted, by an intuitive approach that prima facie should support the advocates of FET. The independence assumptions which render the results counterintuitive are improperly applied by advocates of FET (in particular, they do not make the Judy Benjamin problem a case for Jeffrey conditioning). The method of coarsening at random does not apply to the Judy Benjamin problem once the analogy to the Three Prisoners problem is fully appreciated. In conclusion, the philosophers have not made a persuasive case for full employment. Scientists who use the principle of maximum entropy (whose applications span a variety of disciplines) can do so without worry about this instance of "philosophy in the philosophy of science."