Proof by OpenAI of the existence of Quantum Yang-Mills Theory
4th Statement by the Shepherding Committee, Nov.25, 2026

Michael R. Douglas
David J. Gross (Chair)
Arthur Jaffe
Igor R. Klebanov
Nikita Nekrasov

There has been a good deal of controversy over our decision to withhold the proof materials provided to us by OpenAI while we reviewed their correctness and the fairness of their attribution. There are good arguments on both sides, and a judgment call was needed. One principle we feel strongly about is that we should act on a policy we could apply to anyone, not only OpenAI. Accordingly, when OpenAI approached us with an important claim that we had neither expected nor solicited, we thought it our responsibility to check it carefully before distributing it, as we said in our first statement.

We have now checked and reported on the first OpenAI submission, and the experience has persuaded us that a check before release is valuable. For a problem like Yang–Mills the hard question is not whether the formal proof is valid, which a computer settles, but whether the theorem proved is the one announced. The formal theorem OpenAI offered as the test of its claim was initially a bit too weak to establish that the theory constructed is Yang–Mills theory, and we had to formulate stronger tests of our own, which the submission passed. In addition, the earlier work on which the construction rests is not properly credited. These shortcomings are a good argument that material whose publication is left to a group like ours should be held for a short, fixed period, so that it can be released together with an account of what it does and does not establish. A brief hold before posting is already accepted practice. The ArXiv, for example, holds submissions for a few days while its moderators examine them. The questions we have to answer are even harder than theirs and need more time.

But a policy of delaying the release of results should not be set by the group that applies it. These policies should be decided through an open discussion within the physics community, which has not yet taken place. We think such a discussion would best be held under the auspices of a professional society. However, until that discussion has taken place, we will not delay release. Therefore, we are releasing today all the remaining OpenAI material in our possession, as we received it, and will release further material if and when it arrives. This release is not an endorsement of this material. Each item is marked as unassessed, we include with it the problems we already know of. Our assessments will follow as soon as they are ready.

The various Lean proofs and the informal proofs can be accessed at:
https://github.com/yang-mills-group

We have also offered to look at other work on four-dimensional Yang–Mills theory, and have received several submissions. Their authors hold their own work and are free to publish it at any time. We will review such submissions as time permits and publish our assessment of any submission that we decide to review---we cannot promise to review each one.

We intend to continue our effort to review the correctness and the fairness of the attribution of all claimed proofs submitted to us. This effort will be greatly aided by experts whom we will recruit. We also intend to organize meetings of our extended group and eventually the larger community in order to facilitate understanding of these remarkable developments.

