

Dear Prof. Kim,

I have looked at the charge to your committee and I notice what appears to me to be a glaring omission. No where in the charge do I find any hint that it is important to understand the question about who might be using the facilities project to be completed in the third decade of the twenty first century.

A serious problem that confronts HEP is how to retain those currently completing their doctoral theses and postdoctoral appointments. These people currently working at CDF, D0, MiniBoone or Minos, will be needed to form the backbone of the program at the ILC. Unless things change they have very limited opportunities to hone their skills, they have no opportunity to work on experiments of their own choice. It will be difficult to identify those outstanding individuals who should lead the efforts at the ILC.

We also need to understand how we are going to attract and maintain the flow of new people into high energy physics.

I do not believe that the ILC will be doing physics before 2025, or 18 years from now. Thus the new graduate students who might be working on the experiment are now 6 and ready to enter kindergarten. The experiment(s) will be led by people who will be about 50 then, with almost certainly a few grey beards. The problem is not the lack of potential graduate students in 2025, the problem that I see is a dearth of faculty in American universities to train and mentor these young physicists. As an example, your department at the University of Chicago, lists 11 people in high energy experimental physics. All but two received their PhD before 1985 and are therefore likely to be retired by the year 2025.

American high energy physics, from its inception in the early '50s has found its greatest strength in the American universities. Faculty in the universities have led experiments and trained graduate students. This has occurred not only at a few elite universities but across the broad spectrum of institutions in the panoply of American higher education. This stream is likely to dry up, with dire consequences to our future in HEP, unless in the next two decades, there are opportunities for young people to perform experiments and train graduate students.

The people who might do the experiments are the postdocs and graduate students who are currently working on experiments in HEP. Unless things have changed dramatically from the time I was a faculty member, these people will have a very difficult time getting a faculty appointment or tenure without a demonstrated record of individual accomplishment in research.

With the scenarios that I have seen, including turning off the Tevaton, I don't see how these young people will have the opportunity to demonstrate their abilities. Working at the LHC, at or near the bottom of a gigantic pyramid of physicists, is unlikely to provide the evidence of a person's abilities needed for a faculty position. Without new faculty there will not be people to prepare the experiments and then lead the research at

the ILC. Without the opportunity to work on experiments there will no new graduate students.

There is, I believe, a need for a comprehensive program of experiments in HEP between now and 2025 in which people can be trained and gain experience in doing and leading experiments. What should happen is that people should be encouraged to propose new experiments and the best proposals should be supported. This will most likely require the continued operation of the Tevatron. In what mode would depend on the proposals.

I am quite sure that you may not agree with my analysis but then it is your responsibility to demonstrate that there will be a sufficient cadre of physicists in this country competent to prepare and perform experiments at the ILC if it is located in this country.

Serious preparation for ILC experiments should probably begin in 2017. Are people going to leave their LHC experiments, which are likely producing interesting results at that point, to come to work on an experiment which will not have good data for say ten years? I suspect not.

There must and should be foreign participation on the ILC experiments. Some of the foreign participation should be at the highest level but to think that the U.S. Congress will approve the funds for the ILC without the endorsement and active participation of the American physics community in the ILC is wishful thinking.

I think that the HEP community knows where it wants to be in 2025, if not sooner. The field also more or less understands where we are. I have yet to see a convincing plan on how to get there from here. In terms of what to build, perhaps there is a plan, in terms on people I haven't seen it.

If you want to discuss this feel free to contact me.

Sincerely,

Norman Gelfand

The graduate students currently working at CDF, D0, MiniBoone or Minos, the young people who will be needed to form the backbone of the program at the ILC, have very limited opportunities to hone their skills. They have no opportunity to work on experiments of their own choice. They could go to work at the LHC

I reject the idea that participation in experiments at the LHC will be able to provide the people, either in number or stature, who will be able to lead the experiments at the ILC.