

Report from the National Instrumentation Fellows Subcommittee

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The subcommittee framed its thinking in terms of the problem that is being addressed: the limited participation of young and upcoming US scientists in leading-edge instrumentation R&D, and the concern that this will cause the US to fall behind in our impact on and contribution to developments in both detection and accelerator instrumentation, to the detriment of both the national and international particle physics communities.

Building on our understanding of the consensus reached at the APS meeting earlier this month, we supported the notion of prestigious named post-doctoral fellowships as a way to encourage greater participation in instrumentation R&D. We discussed the former ILC model from last decade, for which PIs were given 50% funding to allow postdoctoral fellows to work half time on instrumentation while also working half time on research. It was generally felt that this was not a particularly successful model, and that instrumentation fellows should be expected to work predominantly on instrumentation-oriented research, which would then allow them to compete for instrumentation-oriented continuing career positions upon completion of their fellowships. While the outlook for the availability of such positions has not been formally assessed, the subcommittee feels confident that the focused training that such support will allow will produce young scientists whose skills are well matched to a broad spectrum of technical careers in both pure and applied research and development.

The subcommittee also supports exploring the notion of providing funding at the graduate student level as well. This might permit some degree of relief from teaching for graduate students early in their studies, to allow them to be introduced to and to engage in instrumentation work at a critical point in their intellectual development, and/or to provide formal recognition for students later in their studies that have demonstrated significant acuity in instrumentation R&D. It was acknowledged that, per dollar invested, postdocs are generally more productive than graduate students, who tend to require only a little less support than postdocs, but who are generally much less experienced and effective. However, we must keep in mind that a primary objective of the fellowship program is to engage and train those who will, in the future, lead progress in instrumentation. In addition, it may be possible to mix modest support with base-grant or department funding to enable a handful of promising graduate students to engage instrumentation work in their first year or two of studies.

Finally, whether through postdoctoral or graduate student fellowships, or both, support would need to be awarded through a rigorously reviewed national competition with well-defined criteria to be addressed in the application. Several models (e.g. NSF fellowships) exist that could help to frame how the application and review process might be carried out.

The group is awaiting results of a survey before possibly further developing this paper. The survey questions are:

QUESTION 1

The DPF Instrumentation Task Force is considering a program whereby funds are made available, on a competitive basis, to support named post-doctoral fellowships in instrumentation. Instrumentation fellows would be expected to work predominantly on instrumentation-oriented research, and would subsequently be expected to vie successfully for instrumentation-related positions at the National Labs, and for faculty or continuing career instrumentation positions at Universities, upon completion of their fellowships. Could you please comment on the availability of positions at your institution for which such a post-doctoral concentration would serve as an important qualification?

QUESTION 2

The DPF Instrumentation Task Force is considering a program whereby funds are made available, on a competitive bases, to defray the cost of supporting graduate students that have no yet embarked on their thesis research (typically first- and second-year students) to allow them to work on instrumentation research instead of teaching. In this way, the Task Force might hope that promising students who might not otherwise have such an opportunity are exposed to instrumentation work at this critical stage of their professional development. Instrumentation work could be carried out either in the local university setting or at a national laboratory. Does your department see this as notion worth exploring, and why? Does your department support R&D activity that could provide an appropriate opportunity for students in such a program? Possibly in combination with base or departmental funding, how much support would need to be granted through this program to enable such a student to have a meaningful engagement with instrumentation research? Additionally, or alternatively, fellowship support could be used to provide formal recognition for students later in their studies that have demonstrated significant acuity in instrumentation R&D. Please comment also on the possible benefits of graduate instrumentation fellowships for students approaching the completion of their Ph.D