

DRAFT  
Proposal to establish an award  
for achievement in instrumentation development  
for particle physics experiments

Advances in our field are driven to a large part by experiment, and the experimental advances are driven to a great extent by developing new experimental techniques and by applying known techniques to new uses. We all recognize this at a practical level. Nonetheless, it is sometimes difficult to get support for innovative developments that might not have a short-term payout in terms of applications to specific experiments. Excellence in instrumentation development is also not universally recognized and rewarded, for example in advancement in University or Laboratory positions. This subgroup is charged with recommending whether establishing a prize or award in the general area of particle physics instrumentation R&D is appropriate and useful to further the goal of better supporting and rewarding instrumentation development.

In considering the need or benefit of establishing a new prize or award, it is useful to see how such work has been recognized. The Panofsky prize has been awarded 6 times for instrumentation development, broadly defined: Willis for liquid argon calorimetry, transition radiation, and hyperon beam development; Nygren for the TPC; Cassidy and Sokolsky for atmospheric fluorescence detection; Menzione and Ristori for silicon strip detectors; Oddone for the asymmetric  $e^+e^-$  collider; and Grannis for the D0 detector. The Nobel prize in physics has gone to Glazer for the bubble chamber, Charpak for wire chambers, Alvarez for the application of bubble chambers for discovering particle resonances, Lawrence for the cyclotron, van der Meer and Rubbia for the SPPS and the UA1 detector, and Blackett for developing the Wilson cloud chamber (Wilson got the prize with Compton for observing Compton scattering). We conclude that inventing or developing detector (and accelerator) techniques, adapting known techniques to execute important experiments, and applying a variety of techniques to develop a complicated and very successful major detector system is recognized and rewarded. The examples given above show that prizes are generally given for instrumentation that has been used in important particle physics experiments and usually to relatively senior people in the field.

We suggest establishing a new award or prize as a tool to encourage and reward physicists early in their careers who work in the area of detector development. It could, for example, be given to recognize *development of new detector techniques or innovative applications of known techniques to an important experiment*. We could implement our preference for an early career award by imposing an age limit or restricting the reward to non-tenured faculty or laboratory or research lab physicists with a similar non-permanent position. It may be that this restriction violates some APS rules, and it may be that this restriction limits the candidate pool too much. It would help to get suggestions from knowledgeable people about examples of early career detector development. If these problems do arise, we could

consider framing the award to be given within some relatively short period (a few years) following the work for which the prize is given.

We recommend that we establish a *substantial award* rather than a prize. First, we have the Panofsky prize, which has been awarded regularly for detector development, but typically to relatively senior people. There does not seem to be a need to duplicate the recognition that the Panofsky prize (or the Wilson prize) affords. Second, it may be easier to fund an award, which does not require a \$250k endowment. Third, it would not set the bar so high (equivalent to the accomplishment recognized by Panofsky, Wilson or Sakurai prizes) that it would be difficult to make an award each year.