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Dr. Karen Byrum
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Dear Karen,

A facility to produce all-glass 8" MCP photodetectors will be constructed at Argonne by the Large Area Photodetector collaboration. The initial configuration of the facility will be designed to produce one MCP tile detector at a time. Production of a sealed all-glass tile requires some processes that are either new or have not been scaled to the 8" MCP size to date. These include fabrication of an 8" active area bialkali photocathode on the borosilicate top window which is transferred to the glass tile base containing the internals, and sealing the top window to the sidewall using a pressure indium or indium alloy technique performed at a temperature below 150˚C. Provision must be made in the vacuum space of the facility for high temperature bake-out of most components of the tile as well as possible "scrubbing" of the MCPs to remove residual contaminants trapped in the pores and characterization of the photocathode and electrical configuration. Because construction of such a facility is new to the HEP Division and because the feasibility of some of the techniques is yet to be demonstrated, we would like to conduct a review of the plans for the facility and the techniques it will use. I am writing to ask you to chair the review committee and to provide you with a charge for the committee. Potential members of the committee have been suggested: Alexey Lyashenko (Yale), Scott Moulzolf (U. of Maine), Jim Buckley (Washington U.), Dan Leopold (Washington U.), Ossy Siegmund (UC-Berkeley), and Jason McPhate (UC-Berkeley). I ask that you, Henry Frisch, Marcel Demarteau, Dean Walters, and I meet to finalize the committee composition and, if possible, include an Argonne expert. The charge for the committee follows:

Conduct a critical review of the design of a production facility for producing 8" active area sealed glass MCP photodetectors one unit at a time. The review should assess the soundness of the design to produce single tiles that meet the specifications. In particular, we ask the reviewer to evaluate the plans for demonstrating the major required techniques for the facility:

1. Fabrication of a bialkali (K_2CsSb) transfer photocathode scaled to the 8" top window size from the 4" demonstration in the glass vessel used in the Argonne photocathode lab (the "Chalice").
2. Production of a low temperature seal using indium or indium alloy wire. The review should consider also the surfaces between which the bond is made for suitability.
3. Bake-out at temperatures of 350-400˚C for most components of the detector
4. Provision of possible "scrubbing" apparatus for removal of residual contaminants from the MCP pores.

The review should include an assessment of the schedule and budget for the facility as well as the resources needed to construct, commission, and operate the facility. The committee should also assess the ability of the facility to be adapted to changes in the design of the above components should modifications prove necessary. As there has been some concern with the choice of gate valves for isolating sections of the facility chambers, the committee should also consider if the valves and load locks are appropriate for the design.

I would hope the review could be conducted in February, 2012. It may be appropriate to have a preliminary meeting of the committee via phone or video link to discuss the process and formulate a set of questions to be addressed by the single tile facility design group. The review itself may be able to be conducted by video link or may require physical presence of the committee members at Argonne. I believe this is another aspect that can be discussed with you, Henry, Marcel, Dean, and me.

For the Large Area Photodetector Collaboration,

Bob Wagner