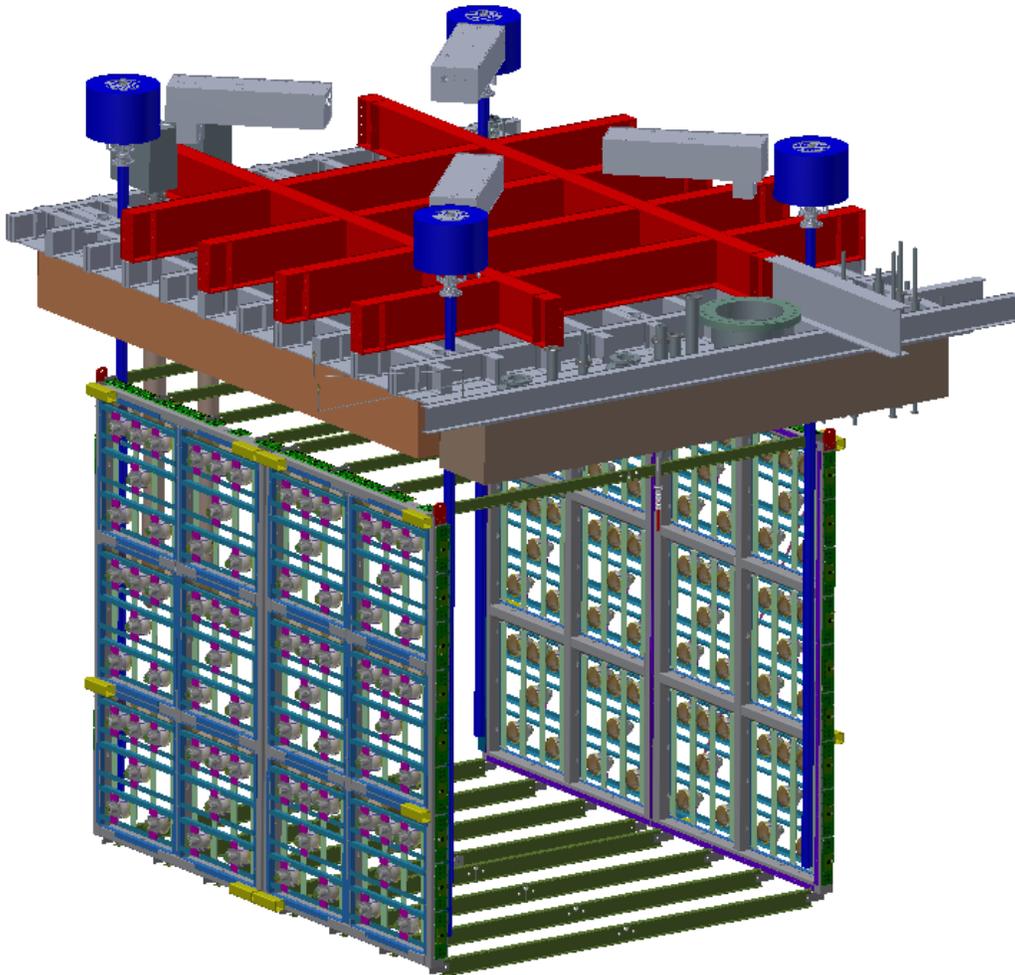


# SBN Progress – July 2016

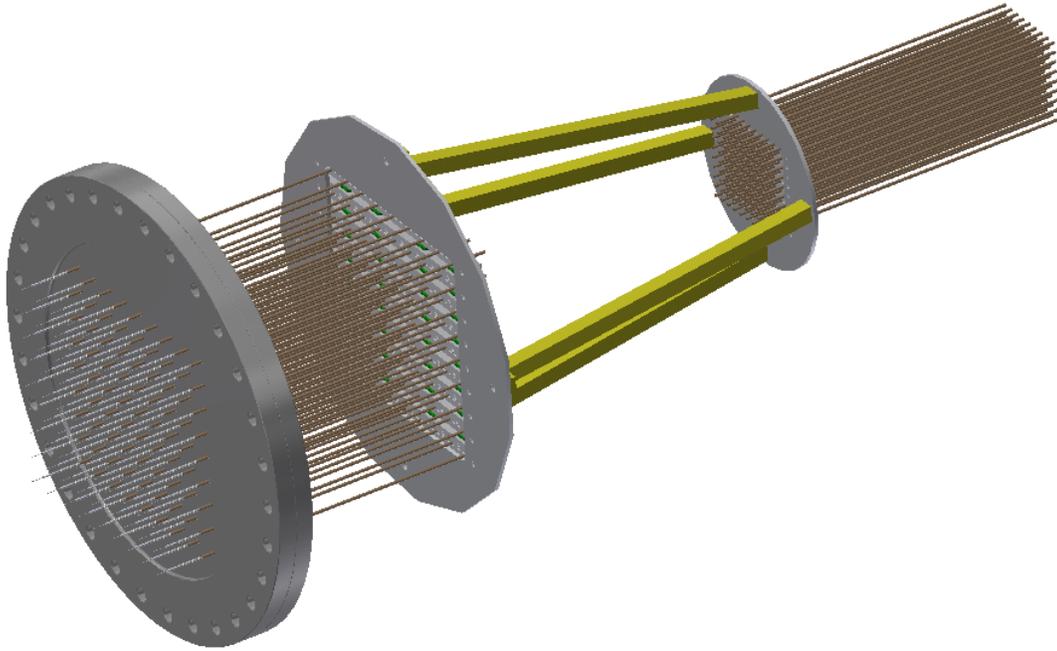
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## I. SBND Photon Detection System Design

The latest design of the SBND Photon Detection System (PDS) has 144 TPB-coated Hamamatsu R5912 8” phototubes (PMTs). The PMTs will be grouped in 24 modules with 6 PMTs per module. An option exists to have some of the PMTs uncoated, which would make them only sensitive to visible light. The TPB-coated PMTs would be sensitive to both visible light and UV light. Figure 1 is a schematic drawing of the PDS support structure and the 144 PMTs. Figure 2 shows a schematic drawing of one of two cable ports with 81 cables per cable port.



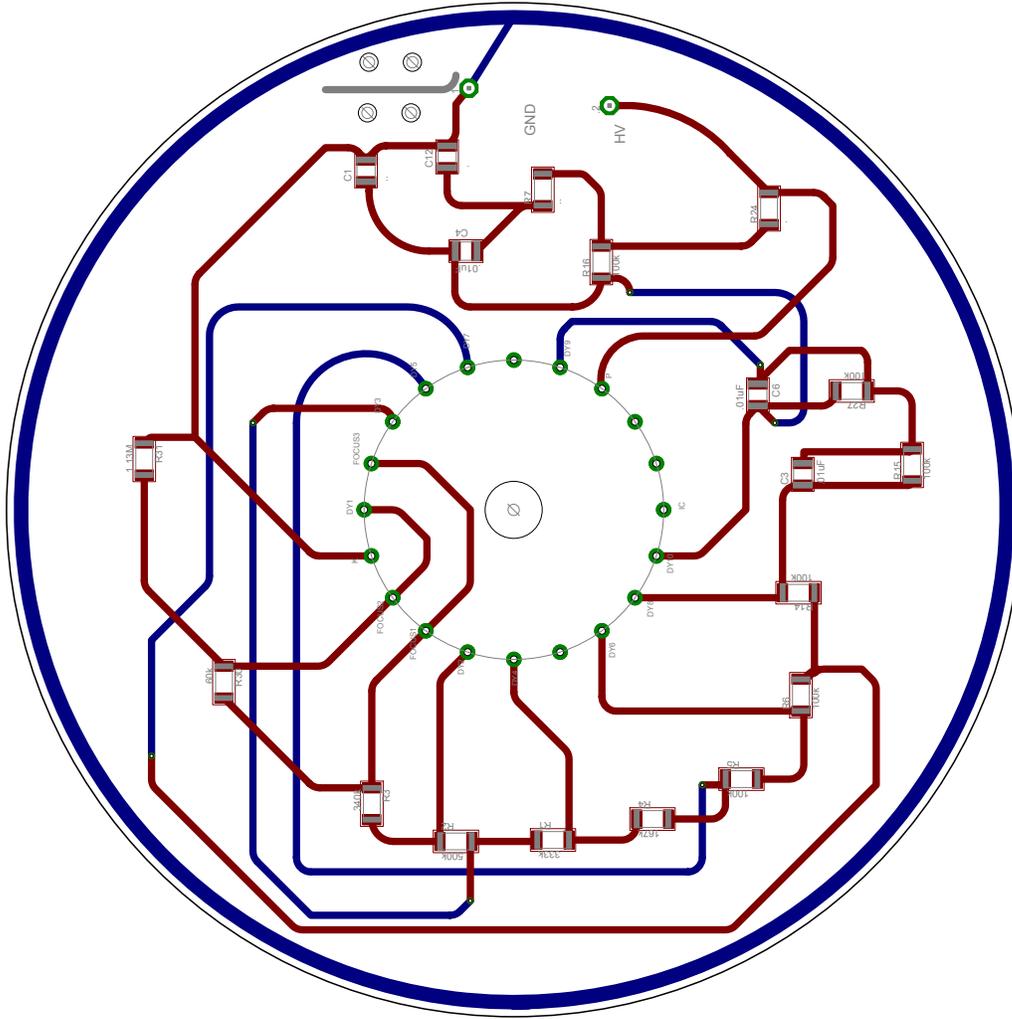
*Figure 1: A schematic drawing of the PDS support structure and the 144 8-inch phototubes.*



*Figure 2: A schematic drawing of a cable port with 81 cables.*

## II. SBND PDS PMT Bases and Electronics

Ten CAEN V1730 digitizer boards have arrived at LANL, together with ePCI readout, trigger board, crate, and HV system. The V1730 digitizer boards have 16 channels per board and operate at 500 MHz with 14 bit optical readout. The 14 bit ADCs will provide 5 bits for a single photoelectron and a dynamic range of approximately 512 photoelectrons. The electronics will have fiber optic readout (80 Mbit/s) and a 64 MHz external clock. Figure 3 shows the new base design layout for the 10-stage 8-inch PMTs.



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Figure 3: The new base design layout for the 10-stage 8-inch PMTs.