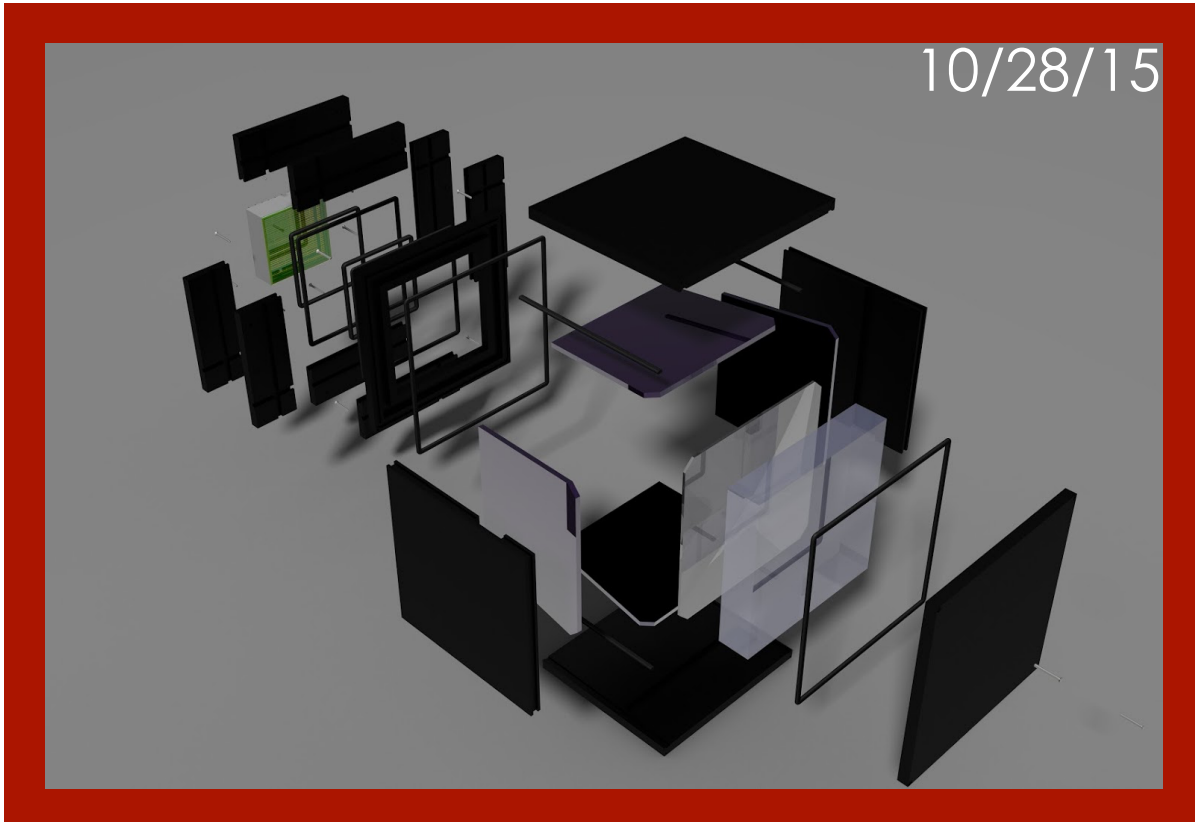

Modular RICH Prototype Design Update

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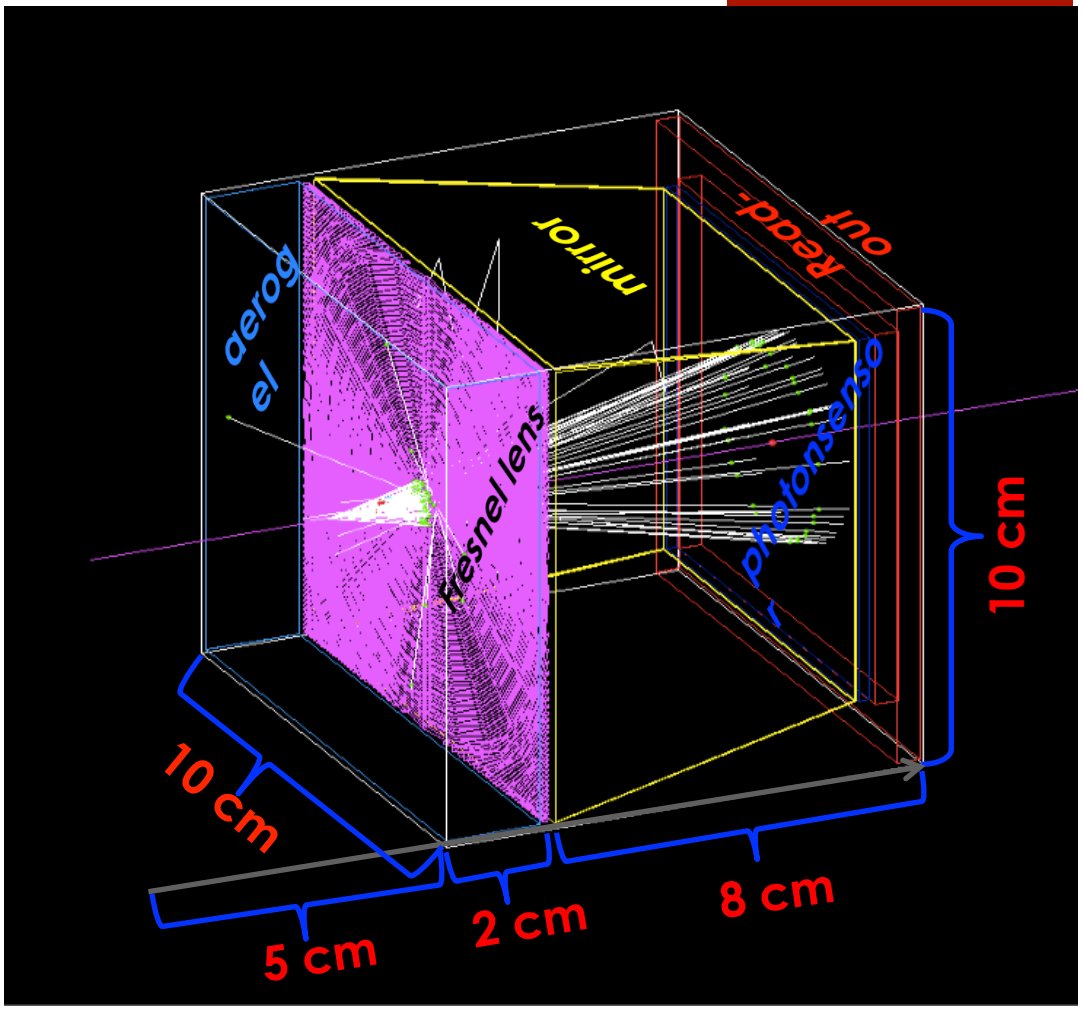
Modular RICH in Simulation

Silica Aerogel (SiO_2) -- Radiator
- Density 0.02 g/cm3
- Refractive index: n=1.025

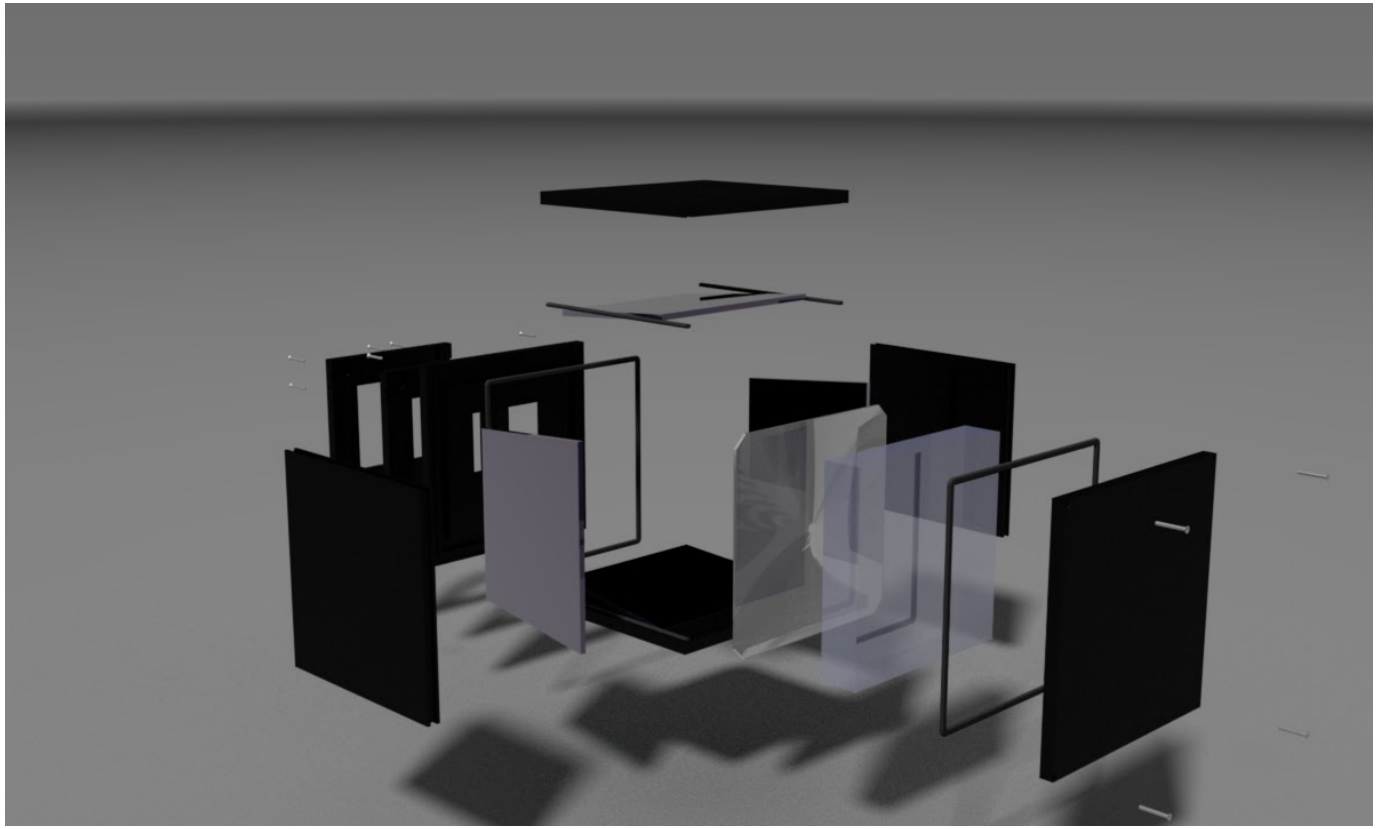
Fresnel lens -- Focus Cherenkov radiation on the photonsensor
- Acrylic, C5H8O2, 1.19 g/cm3
- Four sections, G4Polycon
- 100 grooves

Mirror -- Reflector
- Four sections: left, right, top and bottom
- Reflectivity index : 0.95

Photosensor & Readout
- Block of aluminum



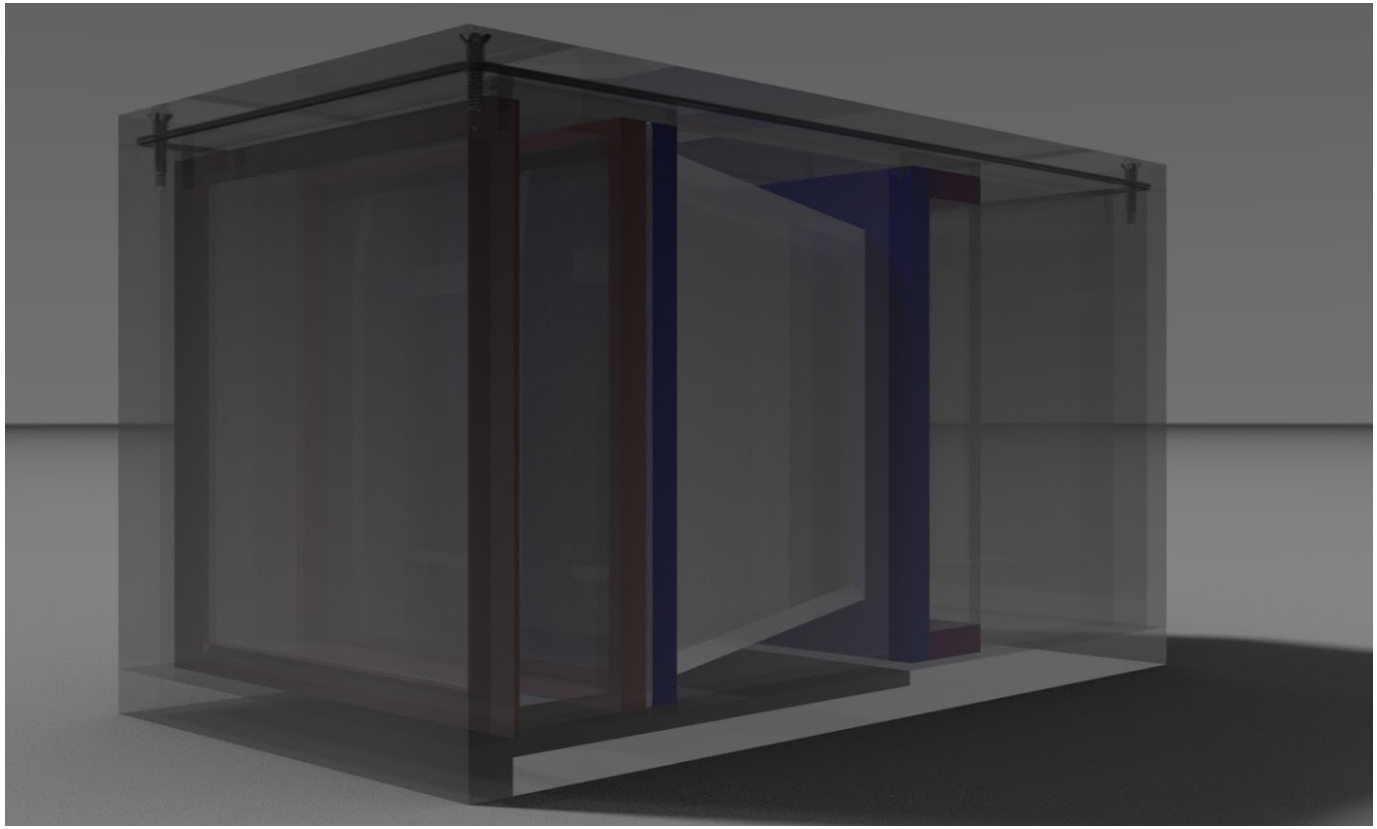
Initial Design Rendering
(Reported by Ping a couple of weeks ago)



Too many Components

Not easy to Make and assemble

Improved Design
(Endorsed by our shop manager)

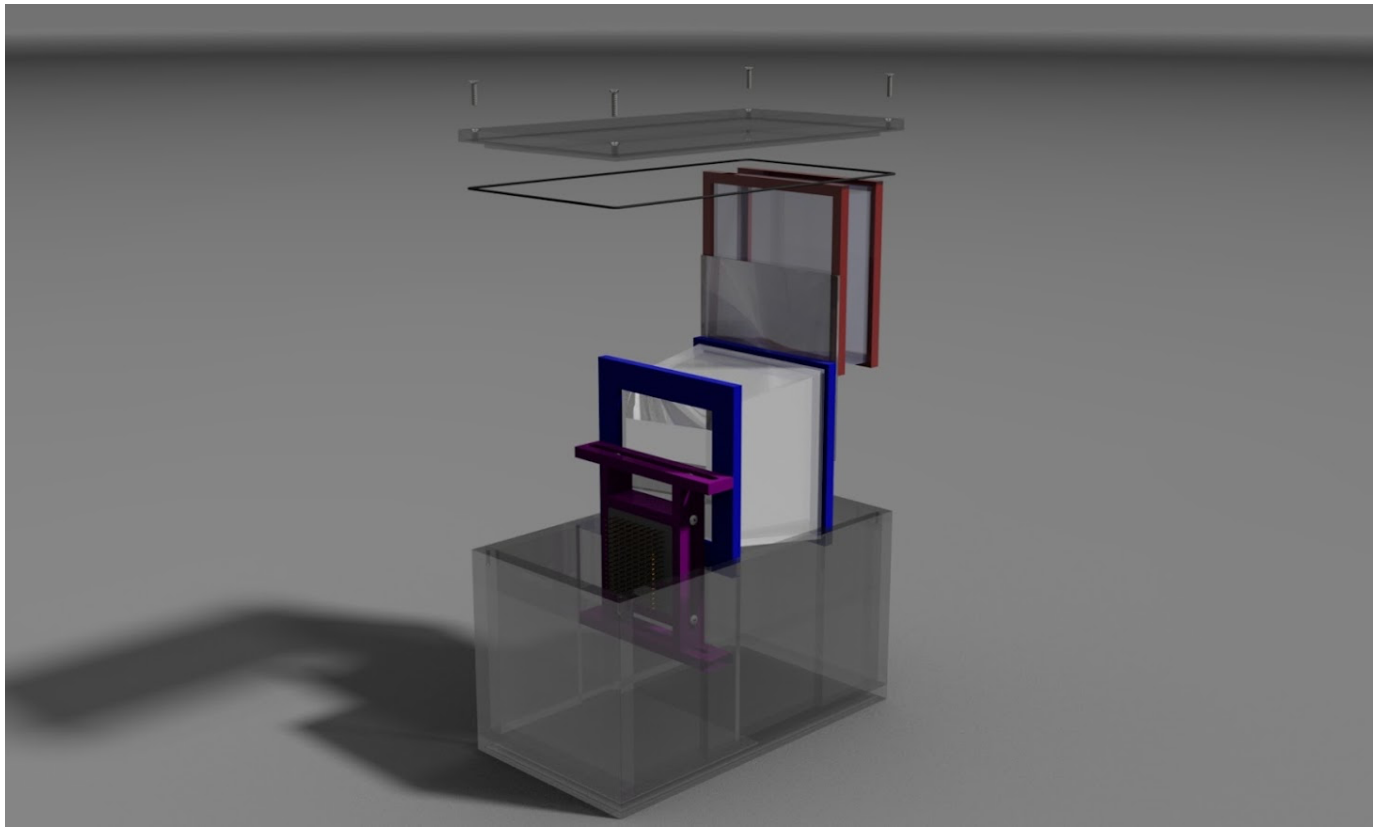


Light tight

Air tight

Easy to build

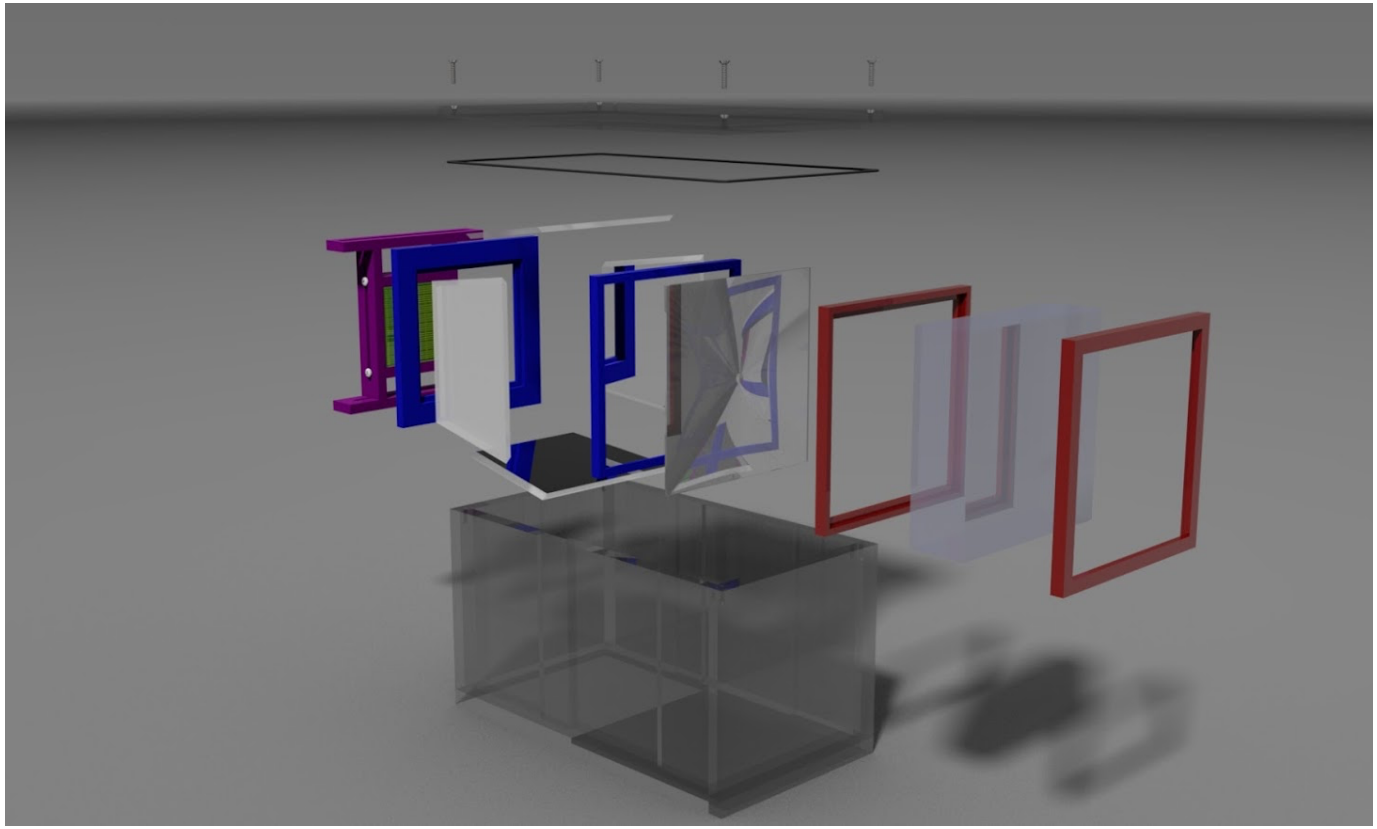
Modular Design



Slide the components into the frame box.

Then close the top

Simpler Assembling with Precision



Components

- Aerogel block will come from Jlab. Need to know the precise dimension.
- Received H12700A from Hamamatsu already.
- Received one sheet of Fresnel lens from Edmund Optics (http://www.edmundoptics.com/optics/optical-lenses/fresnel-lenses/fresnel-lenses/2040/)
- Bought a large sheet of black acrylic at ¼" thick for constructing the box frame from McMaster-Carr.
- About to order front-side coated mirror from McMaster-Carr. We are not sure about the quality of these mirror but would like to try it.

About Readout

- We had a few email discussions with Marco, Zhiwen, Chris and Michael since the last presentation. The readout from the CLAS12 RICH project seems ideal. We will wait for the final product from JLab.
- There is a potential backup solution if we only readout 64 channels using a ready-to-use DAQ system from Vertilon (http://vertilon.com/). It is pricy!

Cost is about $15k

To do

- Continue on finalizing the design. The dimension of the aerogel block from JLab will dictate the design of the frame box sizes. Do we need to fill the box with nitrogen?
- We will go back and redo some of the simulation for a 3cm-thick aerogel block.
- We need to continue the study of the detector performance with magnetic field.