

# Mechanical Structures for EPIC pfRICH

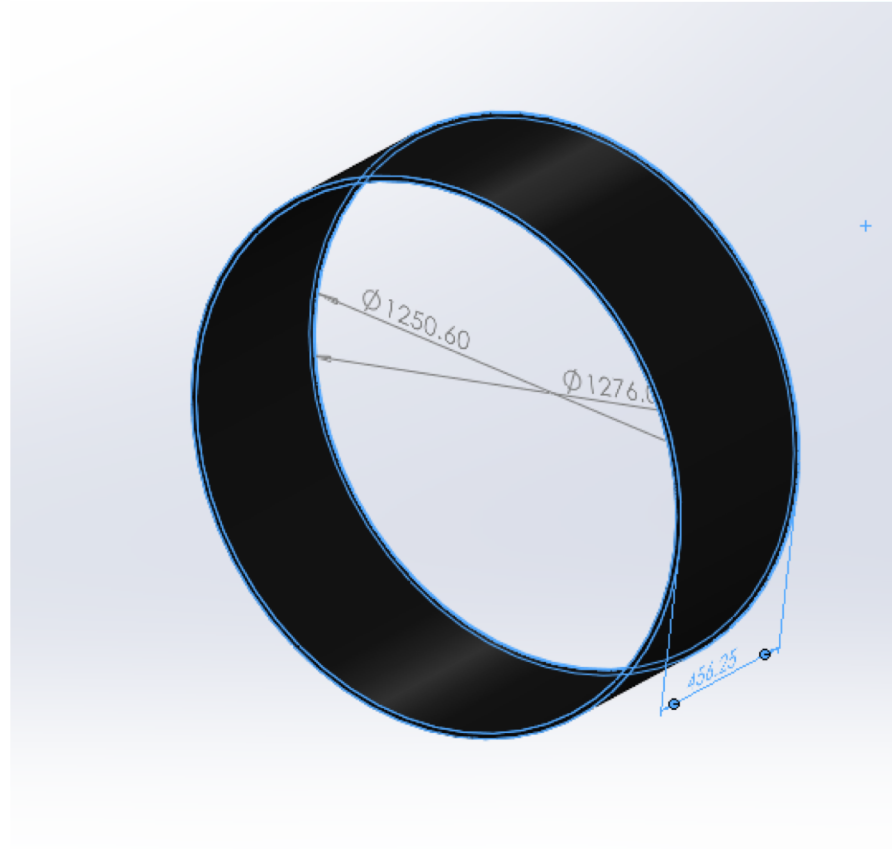
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15<sup>th</sup> June 2023

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# Carbon Composite techniques – pfRICH

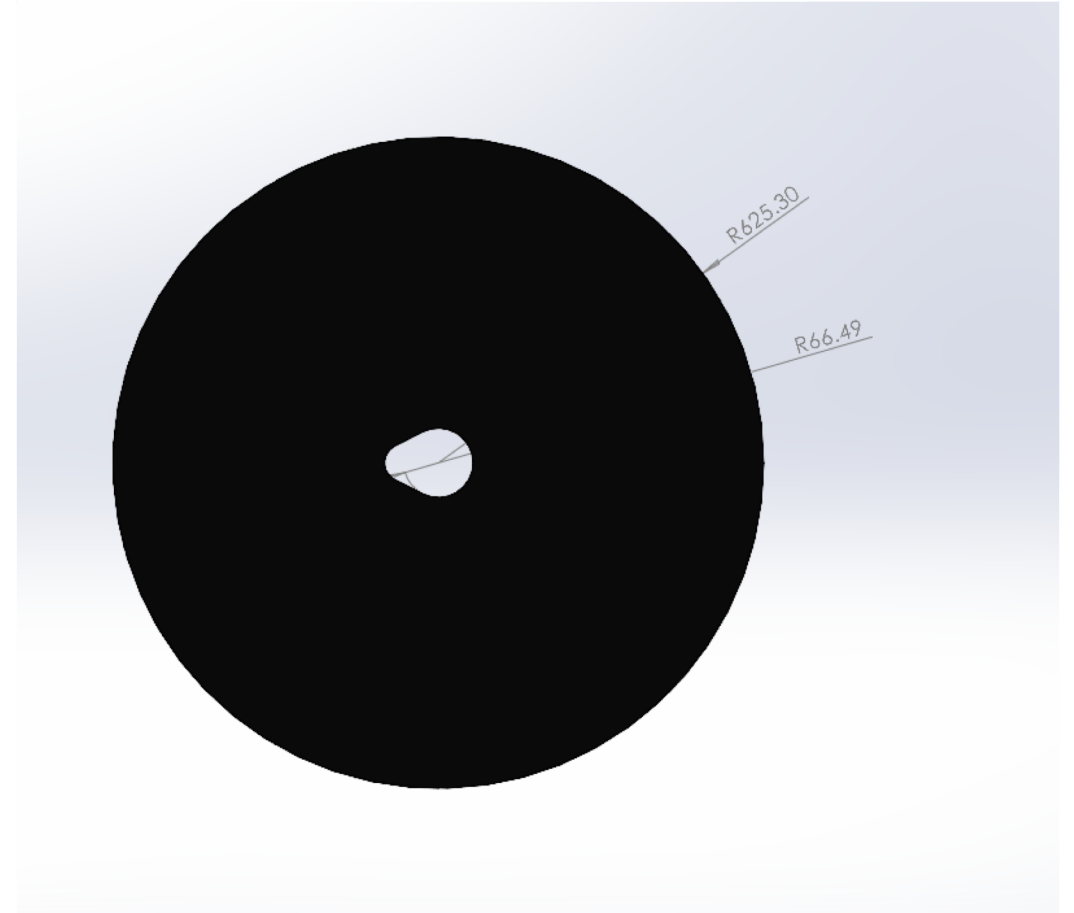
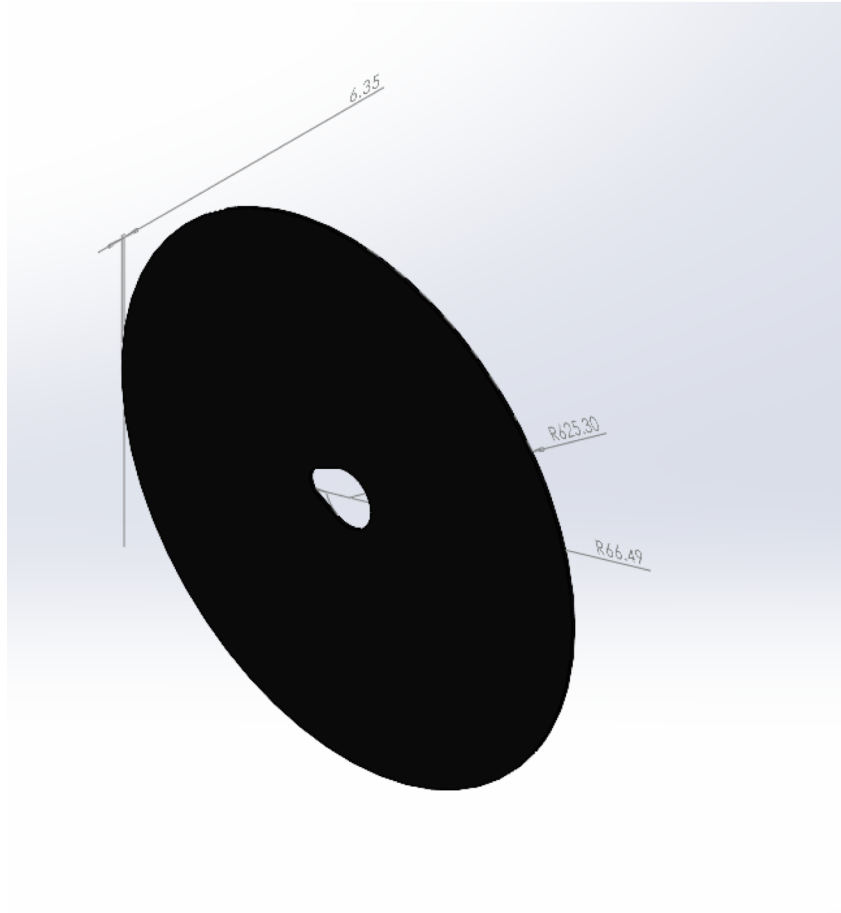


- Cylinder – CF support structure for pfRICH
- Cylinder with Inner Diameter -  $\phi 1250.60 \text{ mm}$  and Outer Diameter -  $\phi 1276.00 \text{ mm}$
- Thickness – 25.4 mm
- Width – 456.25 mm

# Carbon Composite techniques – support structure example from Purdue's CMS work

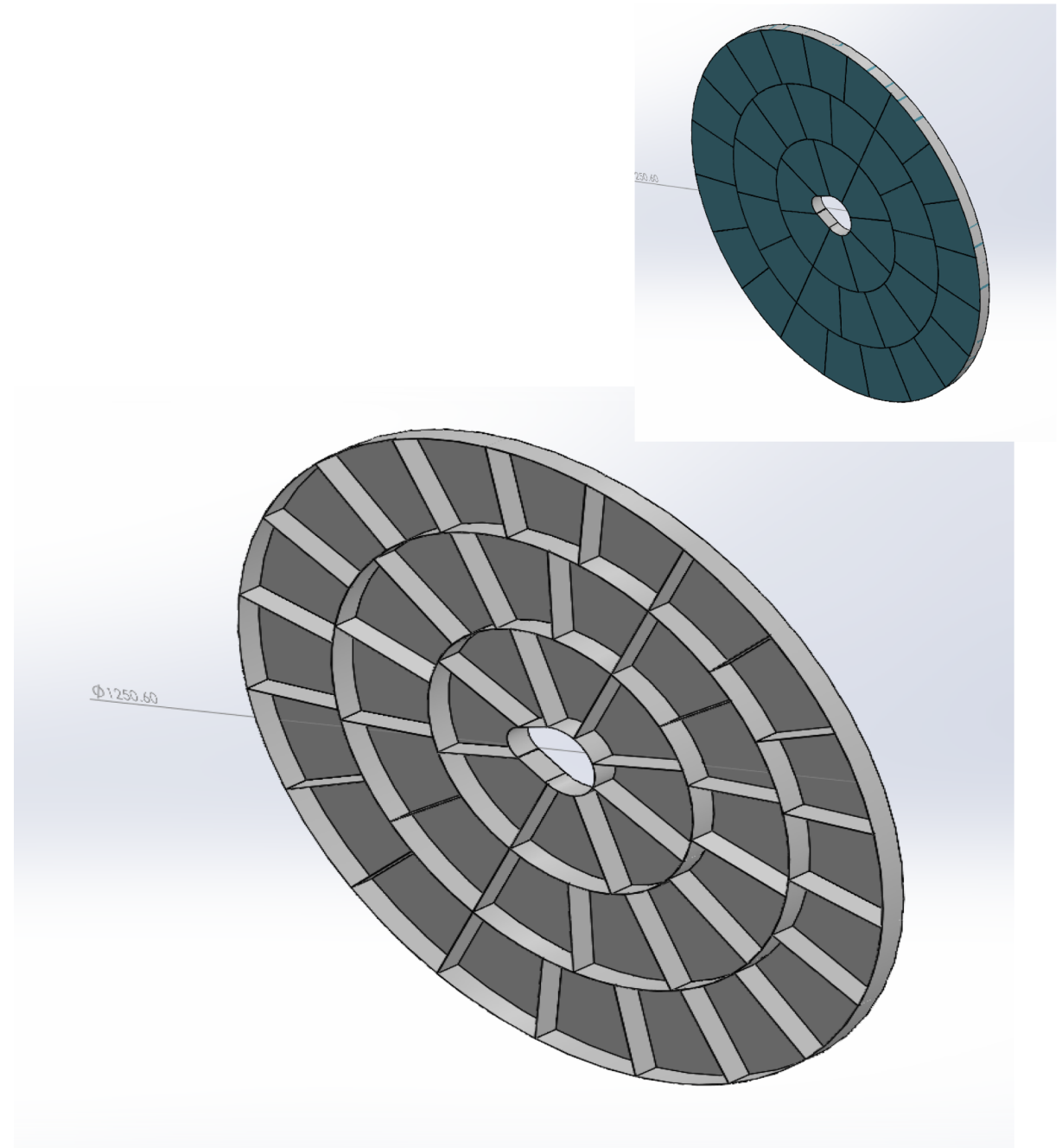


pfRICH containment vessel front face – 0.25 “  
thick carbon composite plate

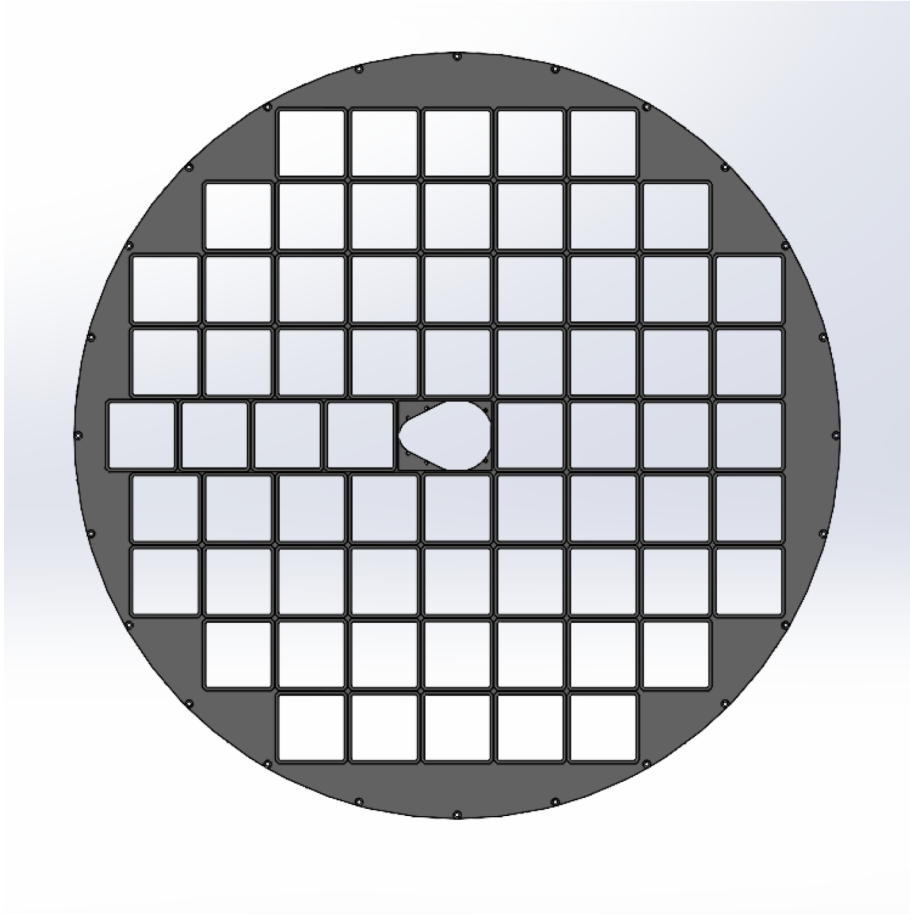


# pfRICH Aerogel Tiling

- It is a support structure with 1 mm partitions as shown in the figure
- The entire structure is 1250.60 mm in diameter



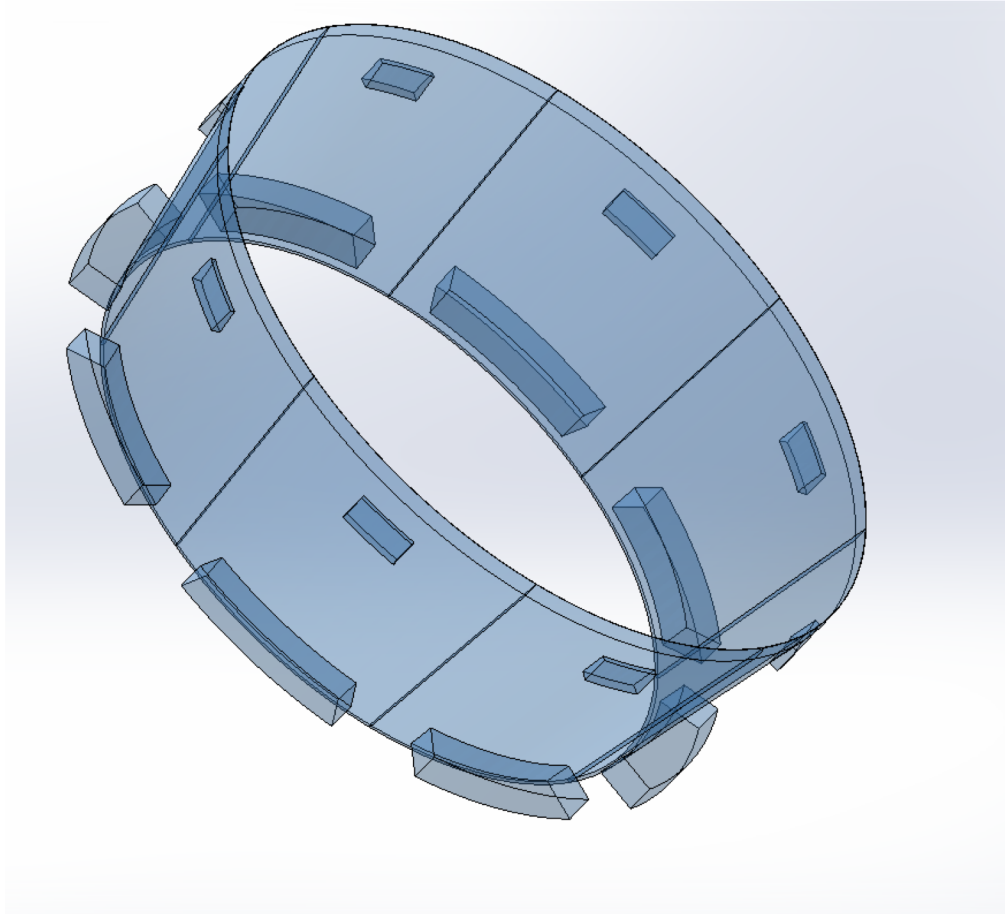
# pfRICH – Tiling Scheme upper plate



- Estimate and make a quarter of this plate
- Currently modelled as aluminum
- Maybe we can make this out of compression molded sectors that are bonded together?
- Function – needs to have high thermal conductivity

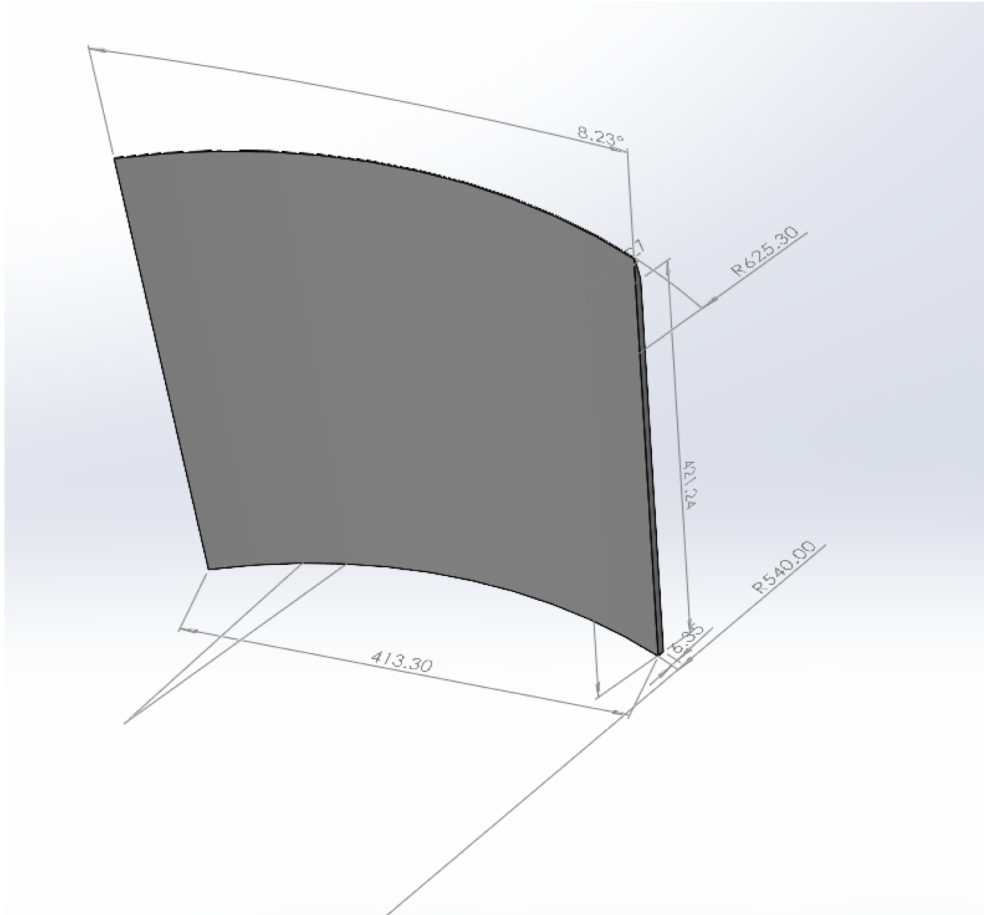


# Outer Mirror – segments to be made on a LSAM printed mold



- Single segment mold isolated and put in the folder -- ...OneDrive - purdue.edu\EIC Project\LSAM - Mirror Mold Print
- Part name - Part to be molded on to LSAM print - pfRICH\_Mirror.stp
- Requirements – the mold should be oversized by at least 4 inches on all sides
- Simulation for mold surface deformation at +80 °C
- Compensation for correct shape at +80°C

# Mold to be at least 4 inches larger in the “plane” of the mirror on all sides



- Single mirror section dimensions in mm
- Estimate the material cost needed to print this mold
- Separately estimate labor + purging material + LSAM running cost