Using 3D Models in Geant4

- The Muon g-2 experiment consists of 12 custom vacuum chambers
- Instead of trying to design each one using native Geant4 shapes we used the CADMesh libraries to import 3D CAD models into our Geant4 simulation.
  - Allowed us to have the precise material within the simulation and know what was in front of our calorimeters and tracking detectors.
  - Easy to completely change volumes if the design changes.
    - Simply get the new model from the engineers, export it as an ".stl" file and use the file in your simulation. Ability to mix native Geant4 models and 3D CAD models.
- Not all the components have to be CAD files.
  - Mix and match with the native Geant4 volumes

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- You have the ability to use the 3D modeling program to position native models as well as find overlaps.
- Output files are larger and it's slower to build the geometries.
  - But once the geometry is built for one event there is so subsequent slow down for multiple events.