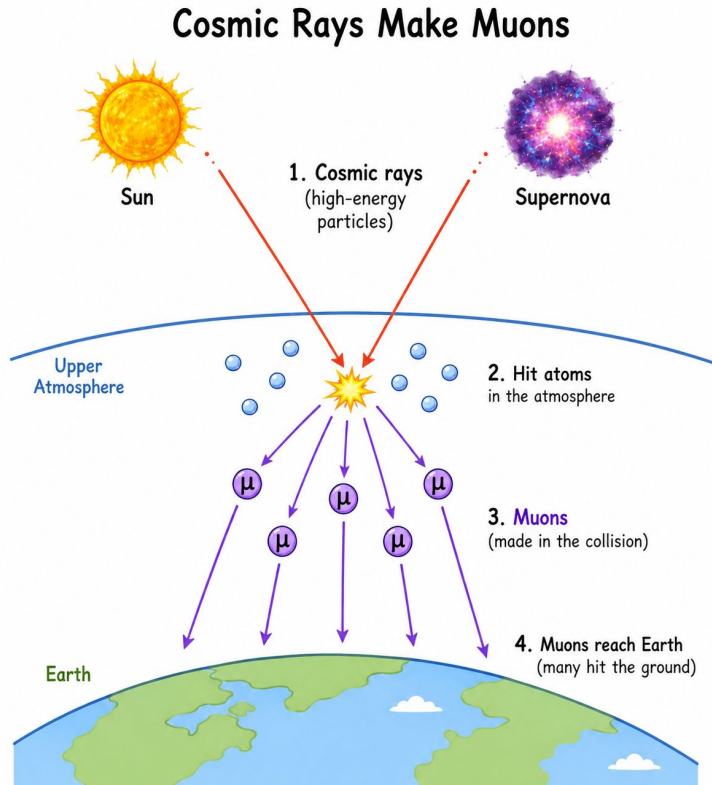


# Muon Veto Panel & 3D Printing

Lucy & Pablo



**Muons** are the electron's **rarer**, **heavier**, and **unstable** cousin



Some of the straight lines you can see here in the cloud chamber are muons!

# Why Should We Look for Them?

Muons distract from our experiment!

We look for a very rare reaction that, **if we can say for certain** that we see it, will explain why the universe is made of matter.

It might only happen 10 times in our detector over the course of 5 years!

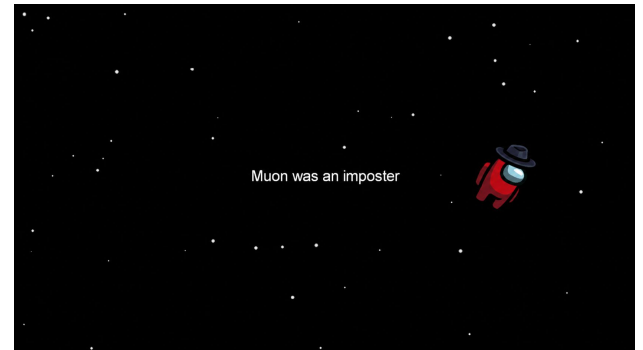
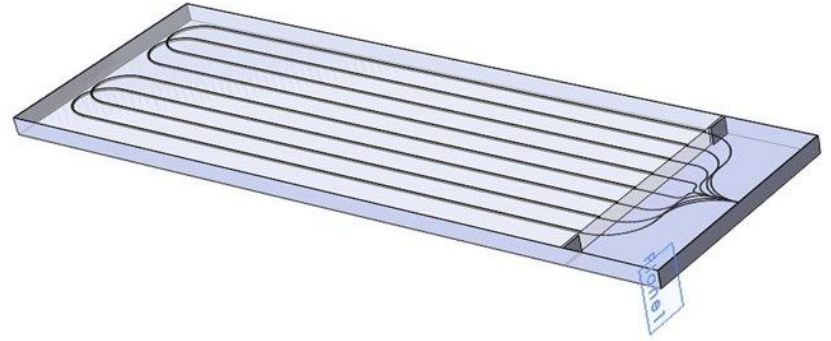
If a muon passes through our detector, it **can mimic the signal** we are looking for.



# What is Muon Veto?

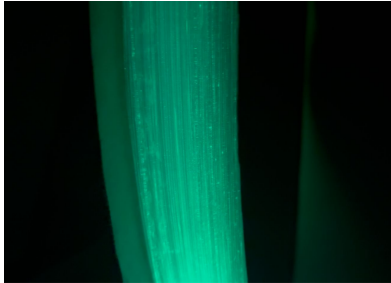
Muon Veto = fancy for saying “getting rid of cosmic particles (muons)”

Plastic panels emit blue light → fibers absorb blue light → fibers emit green light these particles & will glow!

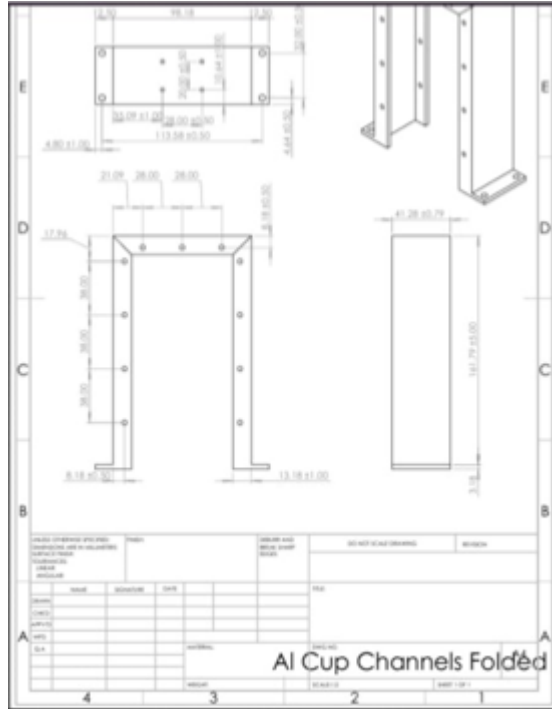


# Glowing Panel with Ultraviolet Light

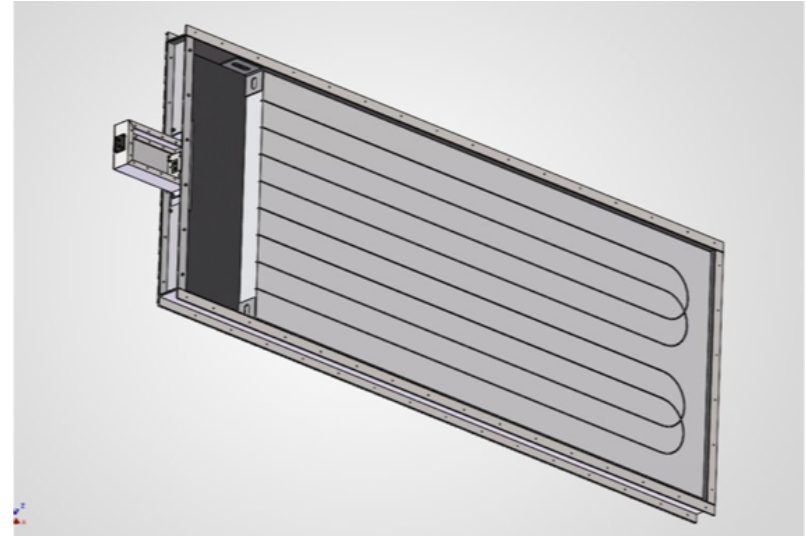
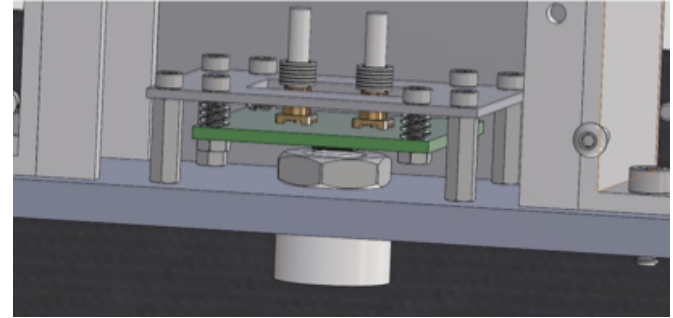
UV light to simulate  
muon detection



# Computer Aided Design (CAD)

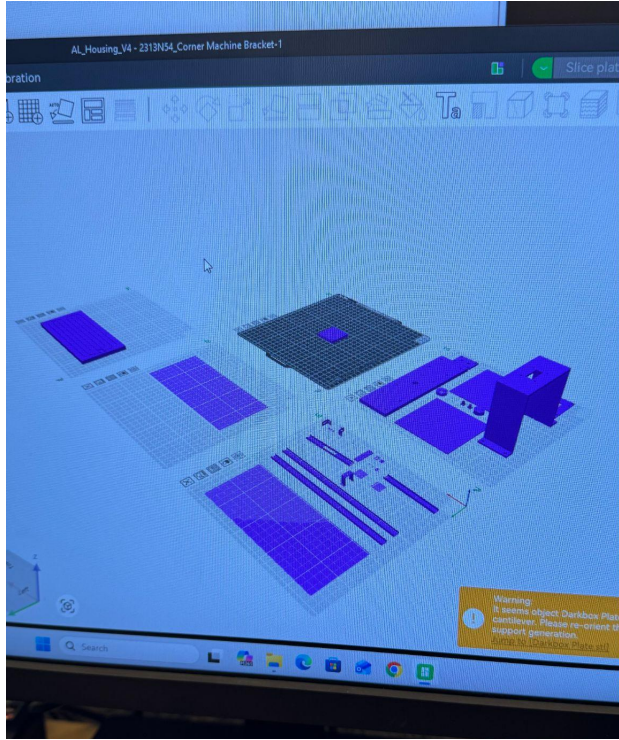


## Drawings



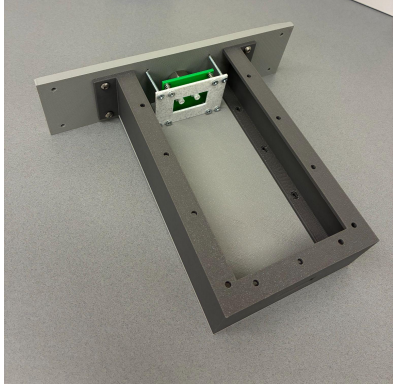
## 3D Modeling

# The Center for Engineering, Innovation, and Design

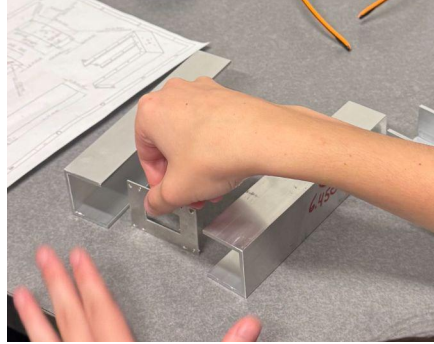


We use the 3D printer and supplies (screws, springs, tools, etc.) at the CEID

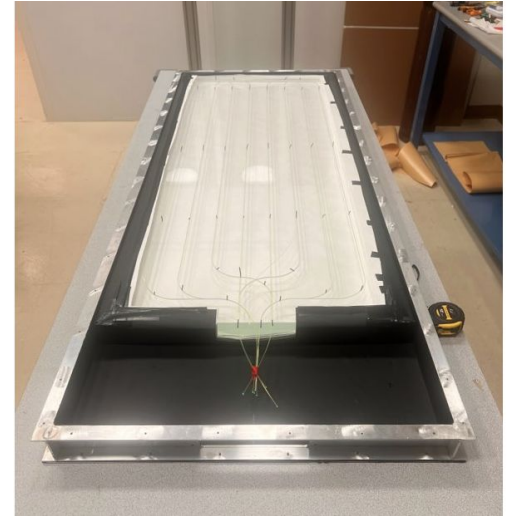
# Results



Life size electronic box model



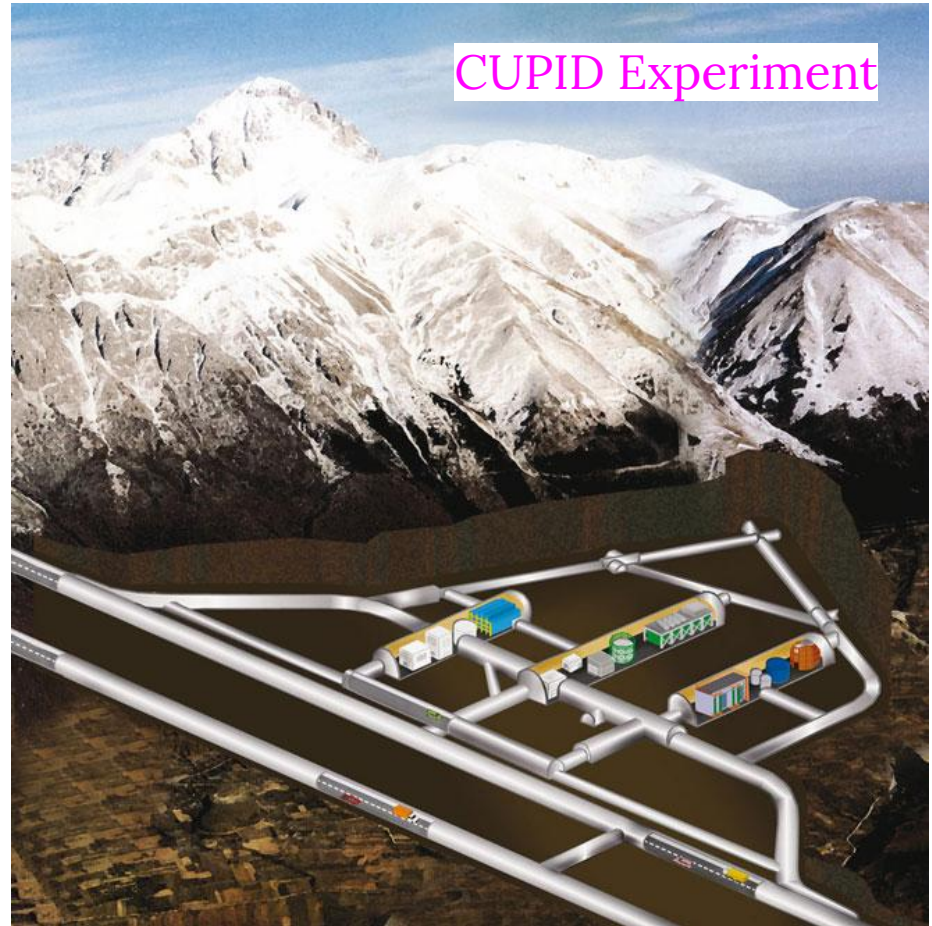
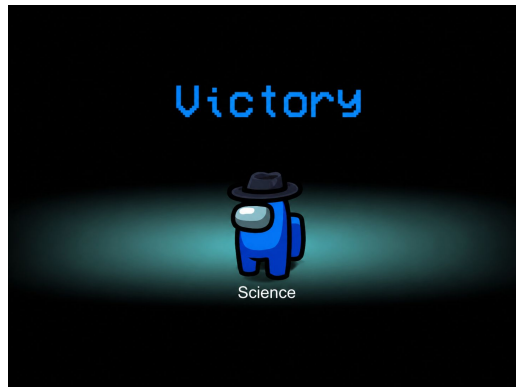
Mini Muon Veto Panel



3D printing helped us fit parts together and check everything works before we build the read thing. We made several adjustments to our design after seeing the 3D print!

# Our hope...

Our experiment, CUPID, which is underneath a mountain in Italy, hopes to have results by the early-mid 2030s!



Muon = Vetoed!

