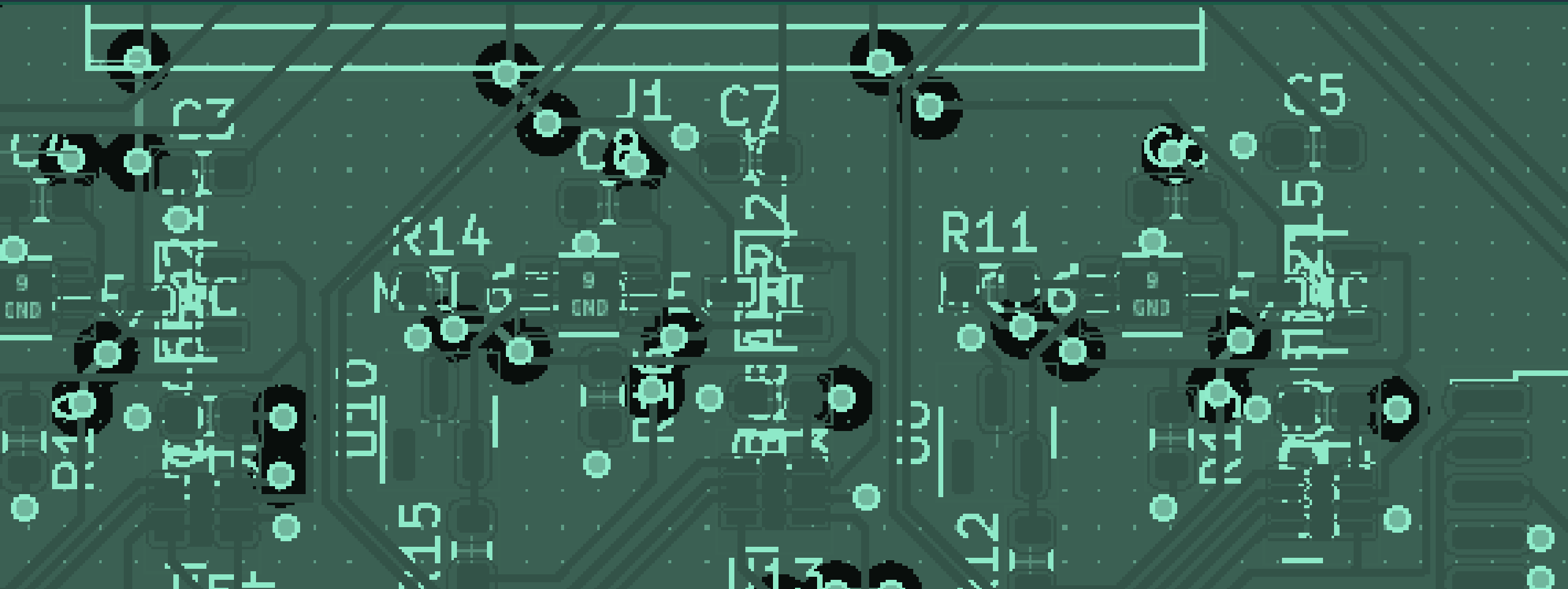


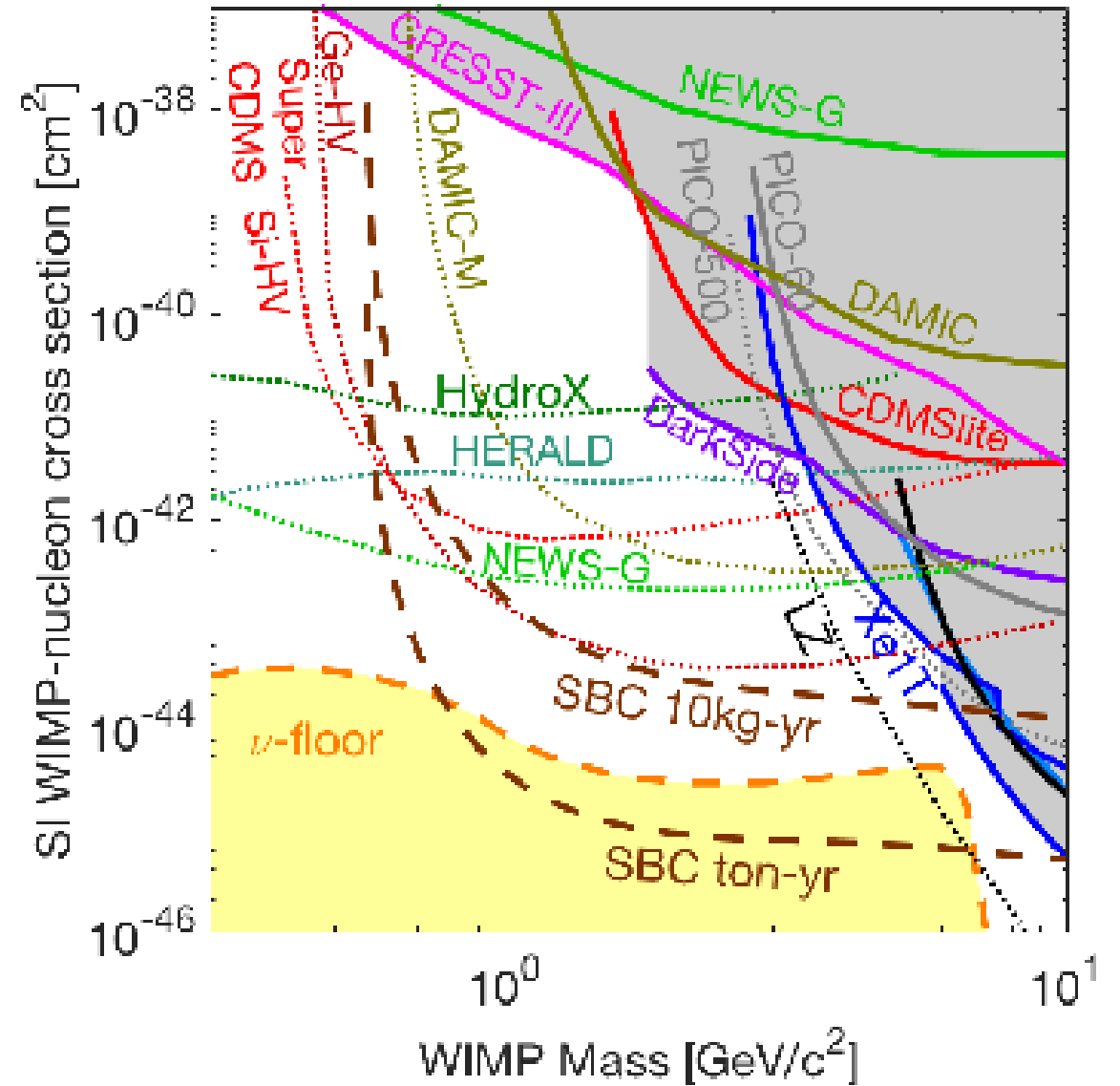
# Thermal Control Systems for SBC

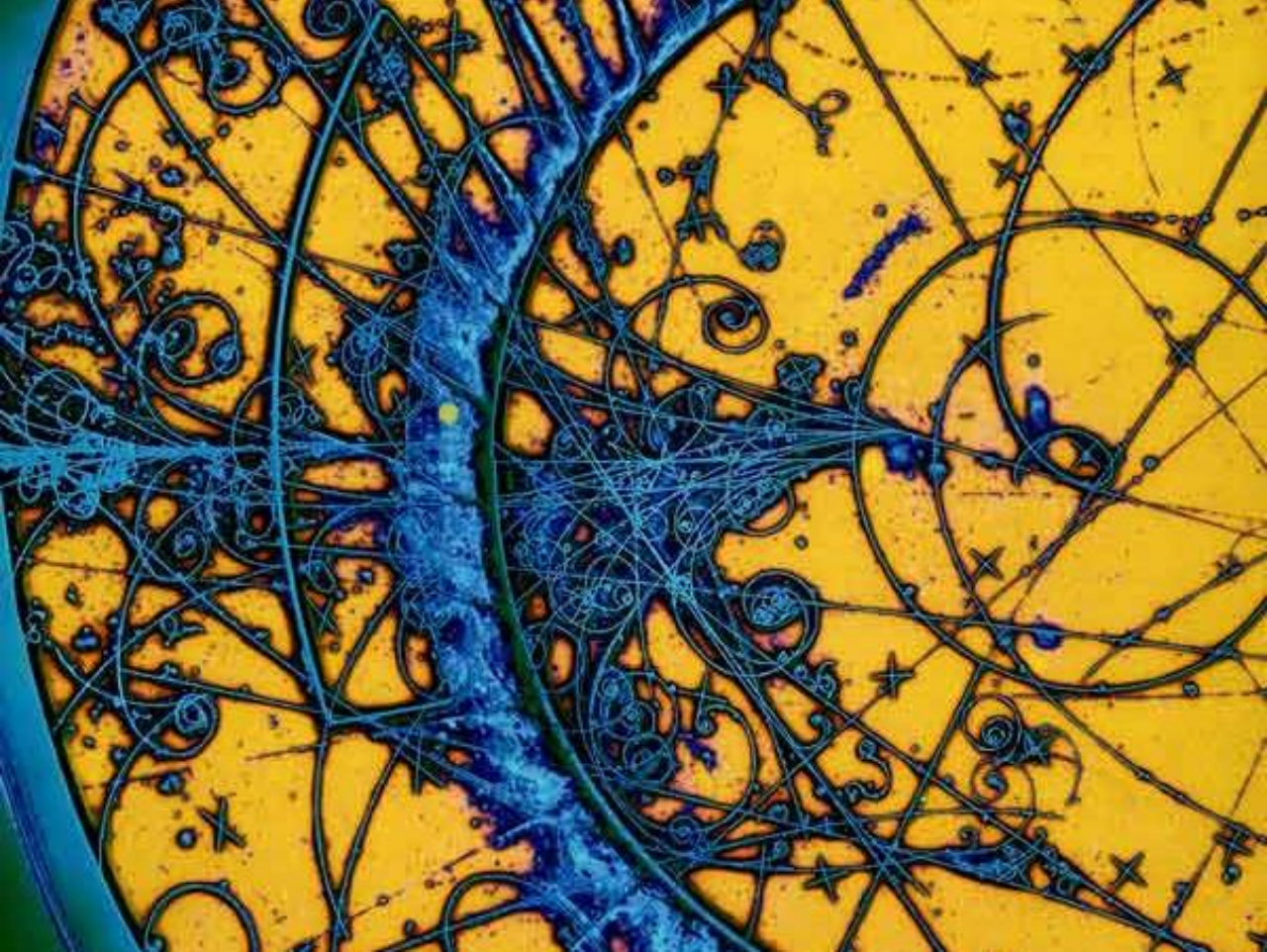
A summer research presentation by Ezri Wyman



# Dark Matter Search

- Different experiments probe different types of particle
- SBC (in brown) aims to detect both dark matter and CEvNS



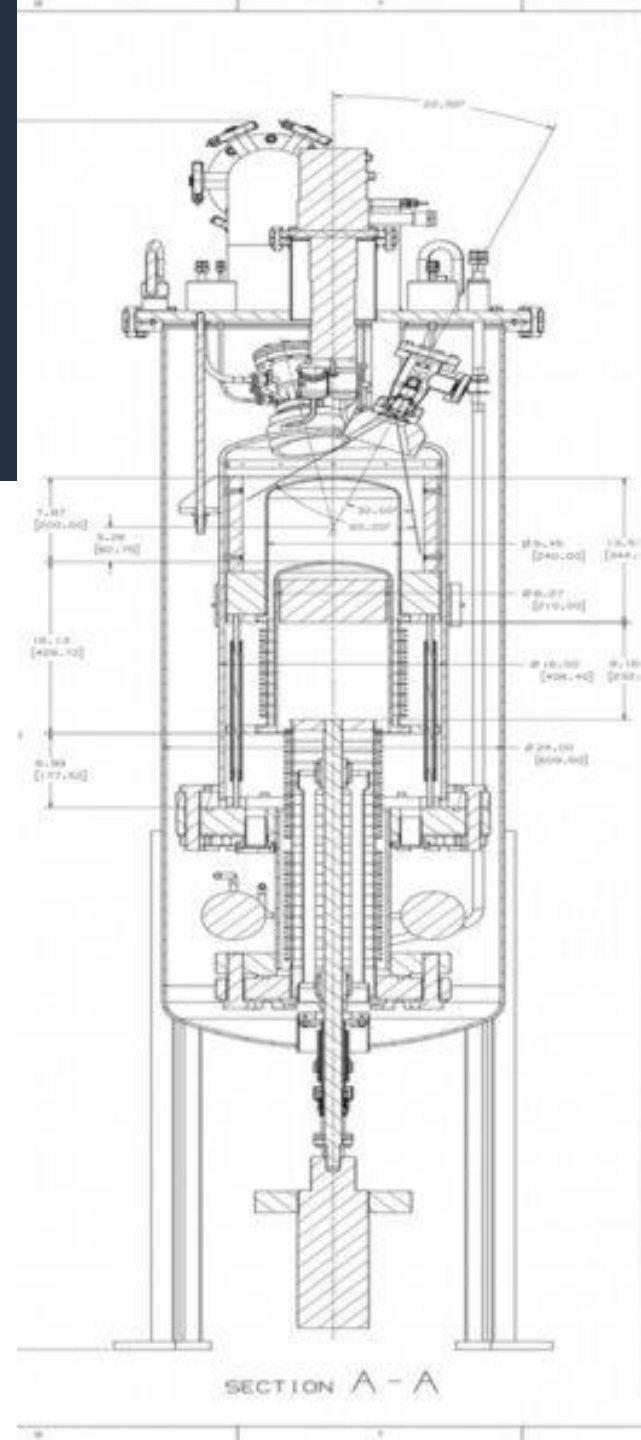


- Created in the 1950s to look at charged particles
- Function similarly to cloud chambers
- Great for dark matter searches

# Bubble Chambers

# The Scintillating Bubble Chamber Experiment

- Superheated liquid makes up the active volume
- Particle interactions that input energy nucleate bubbles
- Scintillation light gives more information about the interactions

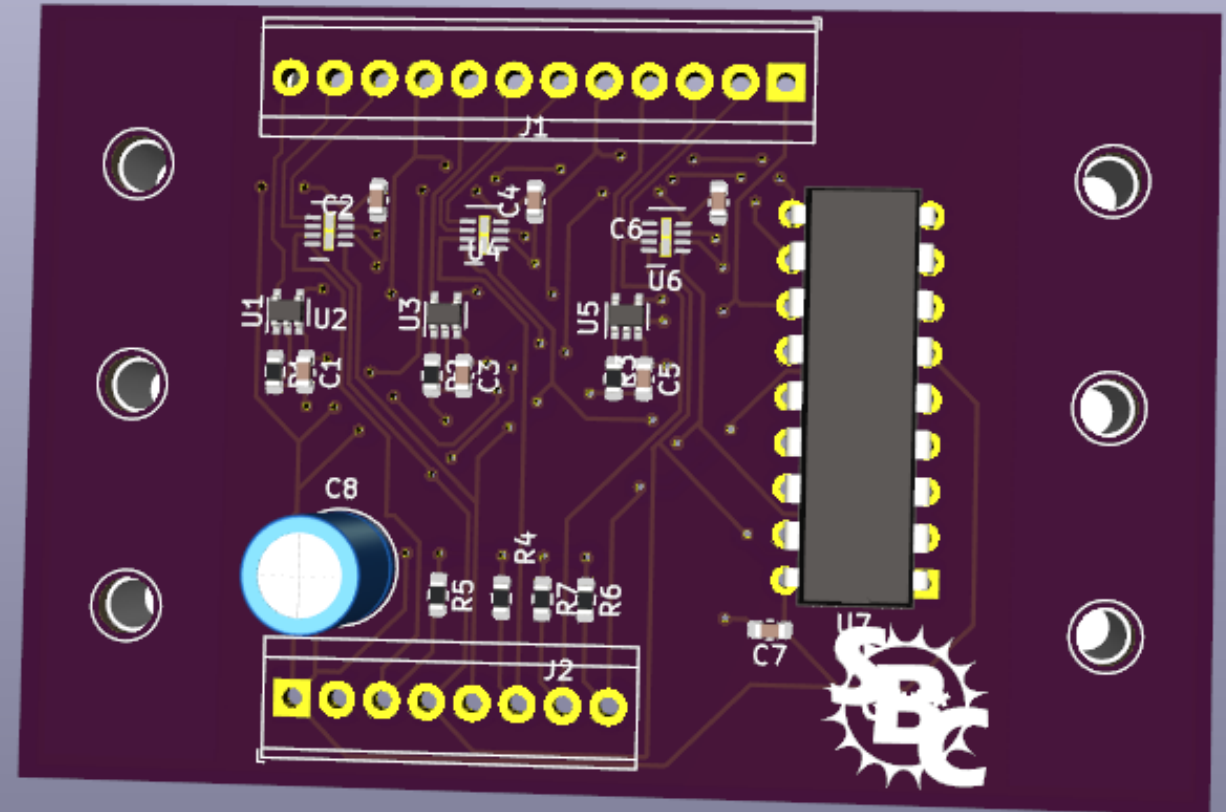
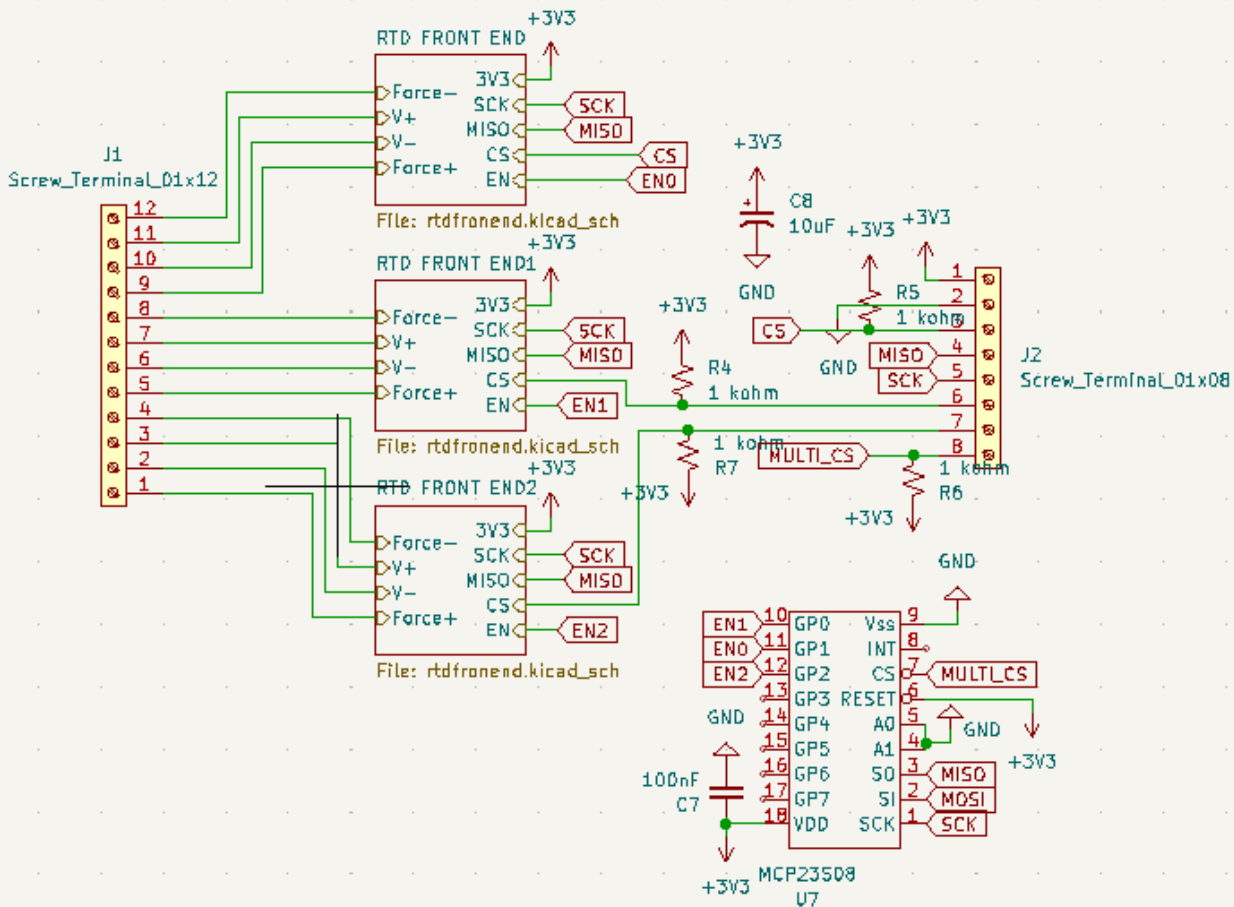


# Thermal Control Systems

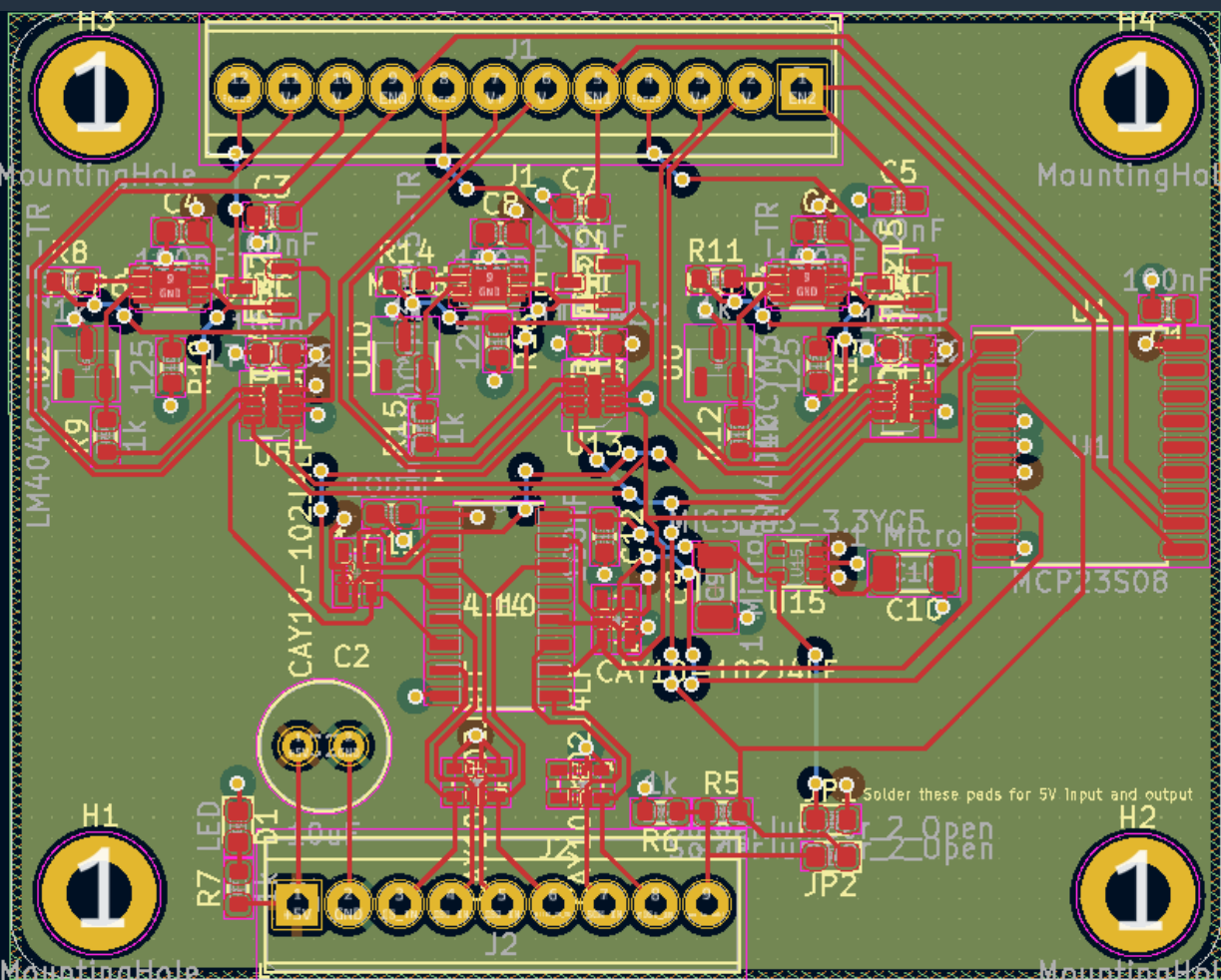


- SBC's active volume consists of liquid argon and xenon
- "Superheated" is still really cold!
- Temperature control is vital to understand the nucleation threshold

# First Prototype

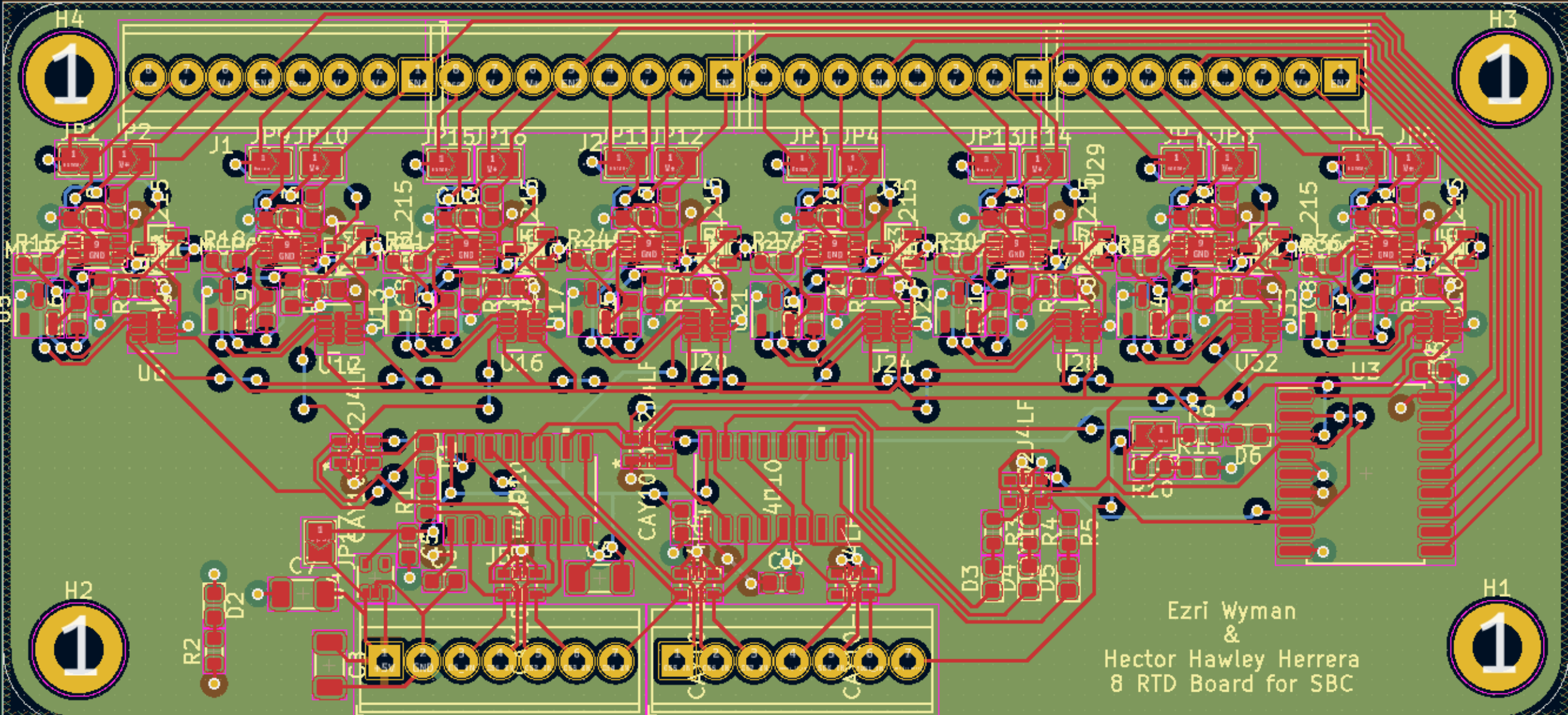


# Second Prototype



- Upped the voltage of the board (and added relevant step downs)
- Changed out components that didn't work as expected
- Condense the board
- Added two layers

# What's Next?





# The Big Picture



- Test setup at Queen's expected to be tested cold in the coming weeks
- Experimental construction is in progress
- Temperature control will continue to be vital through the construction, testing, and run of the experiment