# Detector Support Group

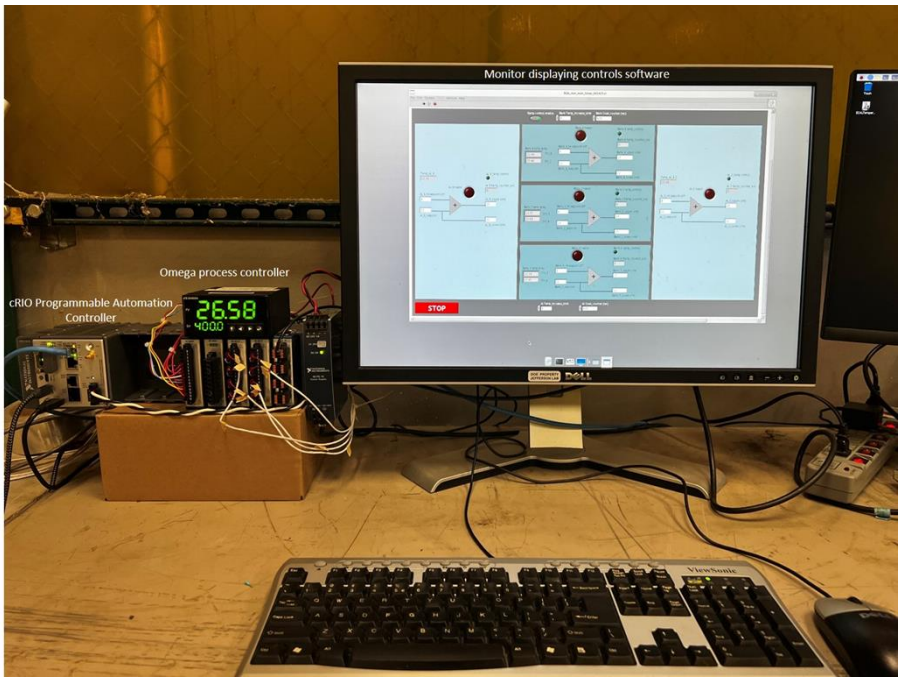
We choose to do these things "not because they are easy, but because they are hard".

**Weekly Report, 2023-04-26**

## Hall A – ECAL

*Brian Eng, Tyler Lemon, and Marc McMullen*

- Completed installation of heater controls for the six-supermodule test stand
  - ✶ Connected nine RTDs for temperature readback of the supermodules, aluminum bars, and the overall heated space of the detector
  - ✶ Connected five Lowell AC relay modules to control power to the heaters
  - ✶ Installed Omega process controller to provide an over-temperature interlock for the system
  - ✶ Verified readback from sensors and tested relays using the controls software



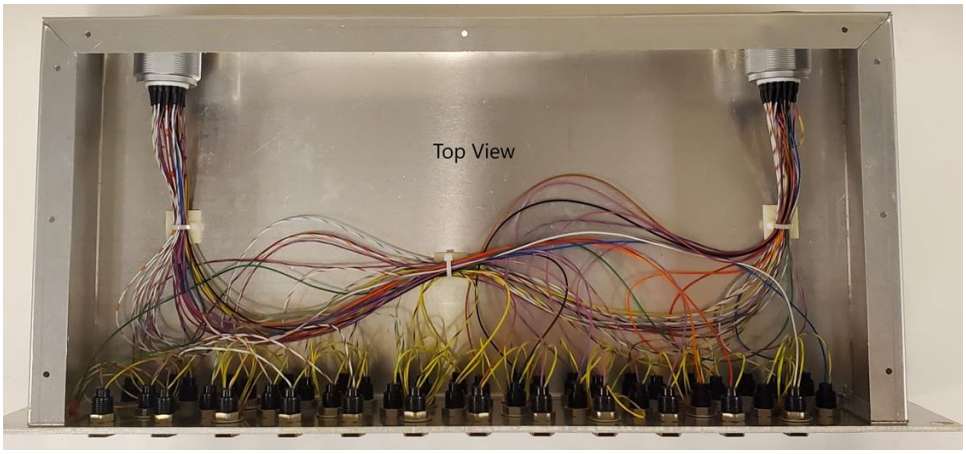

Six-supermodule test stand heater controls

- Continued work on Ansys model
  - ✶ Debugging error received when using SpaceClaim's Share Topology feature to ensure aluminum wrapping is treated as a separate object from the lead glass
  - ✶ Progress hampered because of long processing time before receiving error and inconsistent software license availability

## Hall A - GEp

*Mindy Leffel*

- Completed one high voltage box; nine of 22 completed



Top view of high voltage box

## Hall B – LTCC

*Brian Eng*

- Investigated issue of S2 pressure not reaching desired value and no flow, despite supply valve being shown as open
    - ✶ Omega process controller correctly prevented valve from opening, as setpoints were not correctly changed

## Hall B – MVT

*Brian Eng*

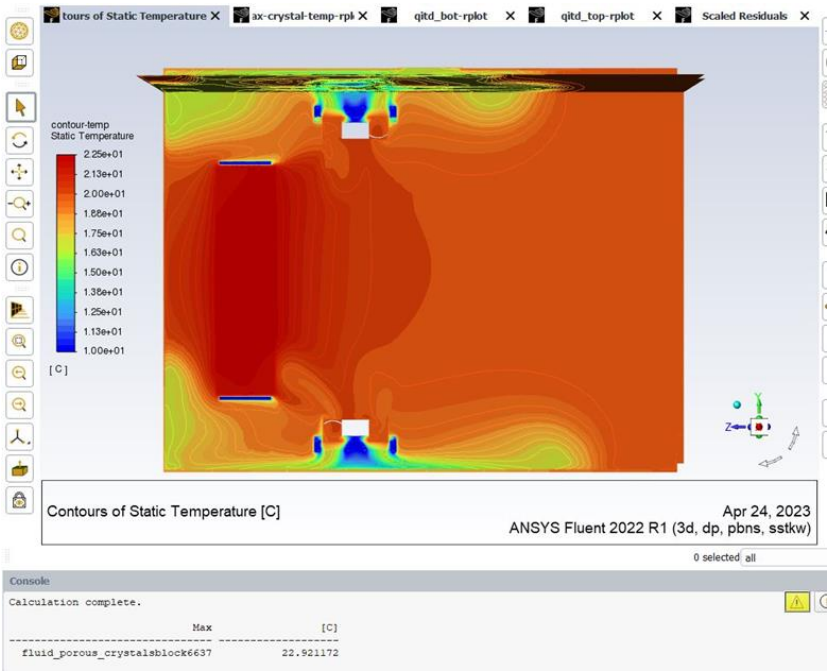
- Re-zeroed all mixing MFCs after closing all valves immediately up and downstream of the MFCs
    - ✶ https://logbooks.jlab.org/entry/4156029

## Hall C – NPS

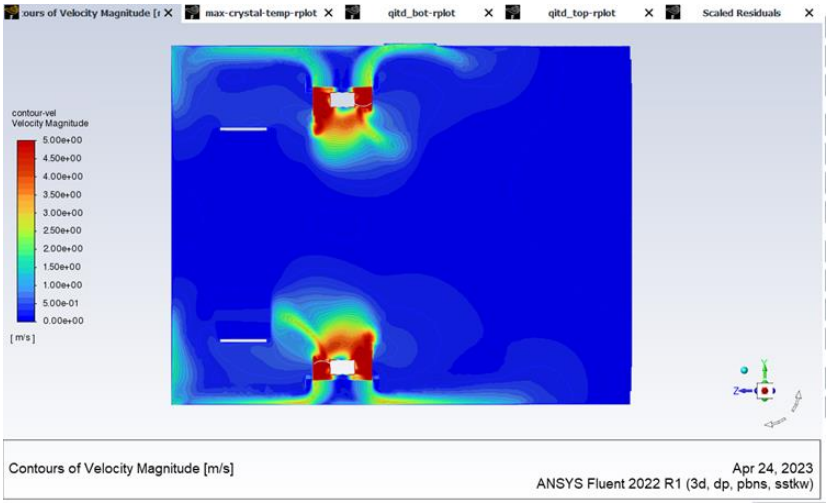
*Mary Ann Antonioli, Peter Bonneau, Aaron Brown, Pablo Campero, Brian Eng, Mindy Leffel, and Marc McMullen*

- Started testing the new back crystal zone Phoebus screen, using random numbers from the LabVIEW program
    - ✶ Debugged problem with PV *hcnps_intlk_cz_t_back_3* (typo in the LabVIEW program)
- Working with CAEN techs to debug issues with CAEN high voltage crates; issues include parameter setpoints randomly changing, voltage oscillations beyond the setpoint, and EPICS communication problems
- Wired remote power controller (RPC) to a cRIO relay module; RPC will be used to interlock the crystal zone chiller
    - ✶ Tested the RPC using a heat gun and a testing LabVIEW program
- Tested the CAEN crates' high voltage interlock using a cRIO relay module
- Completed alarm testing Phoebus screen, without arrays, for front crystal zone

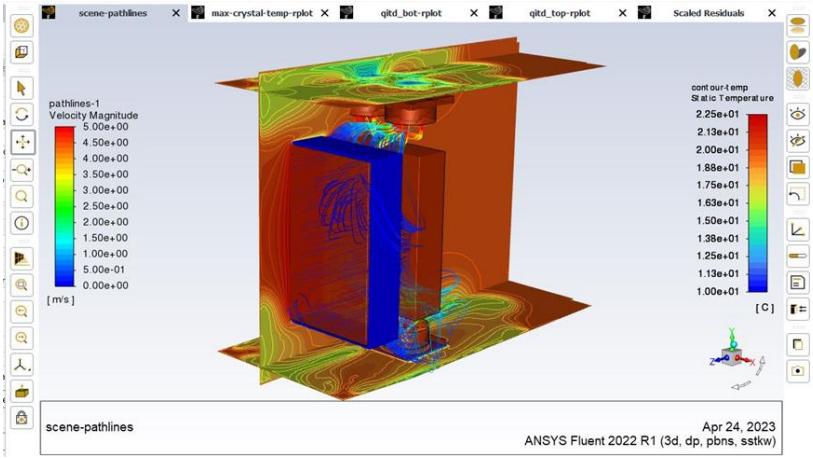
- Completed message monitoring program to aid in alarm system debugging
  - ✶ Standalone Linux program can independently monitor any of the three alarm system messaging streams
  - ✶ Displays the alarm streams via a Linux terminal window; data is stored in a text file
  - ✶ Program was used to debug the Phoebus alarm annunciator
- Continued detector volume thermal Ansys analysis
  - ✶ Modified model in SpaceClaim
  - ✶ Calculated thermal parameters for model
  - ✶ Imported model into Fluent
    - Initial ambient temperature — 20°C
    - Fan velocity — 1650 RPMs
    - Crystal block set as heat source — 3426.76 W/m3
    - Heat exchanger plates temperature — 10°C
  - ✶ Ran initial simulations; reviewing results



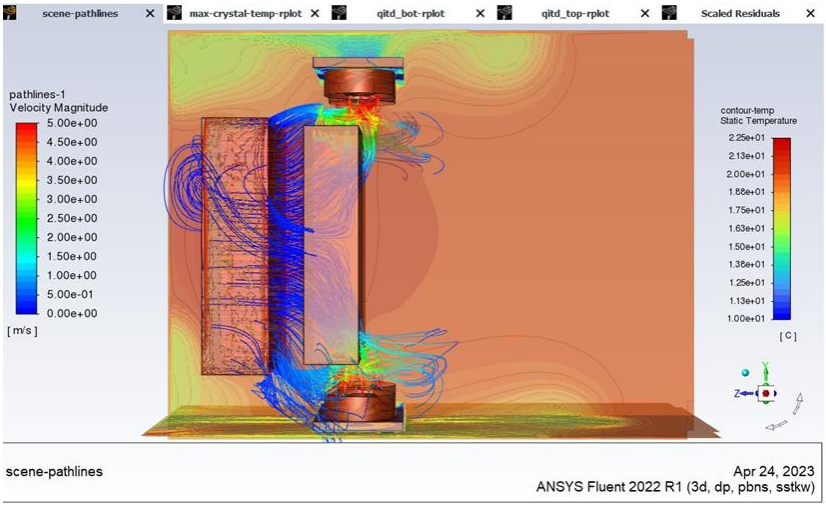

*YZ* plane of temperature contour plot; maximum temperature for crystal block array is 22.92°C




*YZ* plane of velocity contour plot




Isometric view of pathline plot




Right side view of pathline plot

**Hall D – JEF**

*George Jacobs, Mindy Leffel*

- Disassembled, cleaned, and inspected 10 crystals; all crystals cleaned
- Wrapped eight crystals with 3M foil and Tedlar; 726 wrapped to date
- Pre-shaped 48 foils

**EIC - DIRC**

*Tyler Lemon and Marc McMullen*

- Started assembly of optical table side walls
- Submitted facilities management request for three through-holes drilled into walls of subroom for A/C unit exhaust, laser's exhaust fan, and cable passage

**EIC - Thermal Test Stand**

*George Jacobs*

- Added carbon filter to the vent