Thin Aluminum Windows for Liquid Hydrogen Containment

- CNC machining 20 thin aluminum windows to contain $\text{LH}_2$.
  The hydrogen causes the ionization cooling of the muons. New, stronger double bend window design by Oxford Univ. 27” swing ROMI CNC lathe (U. Mississippi Physics Machine Shop) CNC Fadal 50” x 20” 5020A Vertical Machining Center
  180 micron central thickness. First 11 windows done.
  Burst test 2 windows at 300K, 120, 122 psi. To do: 77K.
  QA: LBNL CMM, UMiss Starrett micrometers (3 microns)

Absorber Window Status

- CNC machining 20 aluminum windows to contain LH$_2$. MICE needs 6 LH$_2$ windows and 6 safety windows. MICE needs 5 spares and 3 windows destructively tested. Will destructively test some windows at $T = 77K$ and 300K. Fixtures for destructive LN$_2$ and H$_2$O tests completed. Will pressurize liquid with a tiny volume of throttled helium.

- Window Production.
  All 20 windows have been roughed out of 6061-T6 aluminum. Windows turned on lathe with a machined backing plate. Turned on lathe to 2000 microns central thickness. UMiss micrometer measures at 0 and 15 degree angles. Lathe powered up during measurement. Accuracy not lost. Final cuts taken on lathe. Plywood hats made for shipping. LBNL-Berkeley non-contact View Precis 3000 optical CMM

- First 11 windows completed.
  Burst test 2 windows at 300K, 120, 122 psi (8 atmospheres).
Burst test at 300K with water (8 atmospheres)
Burst test at 300K with water
Next Steps


- **Thinner aluminum** → **Less multiple scattering** → **Cooler muons**
  Look into making 2 thinner Lithium-Aluminum alloy windows. Space Shuttle LH$_2$ fuel tanks are Lithium-Aluminum alloy. Lithium-Aluminum is almost twice as strong as 6061-T6. Burst test at 77K and 300K. For future designs.