

# **WINDOW MANUFACTURE AND MEASUREMENT**

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**Absorber Review**

**Neutrino Factory and Muon Collider  
Collaboration**

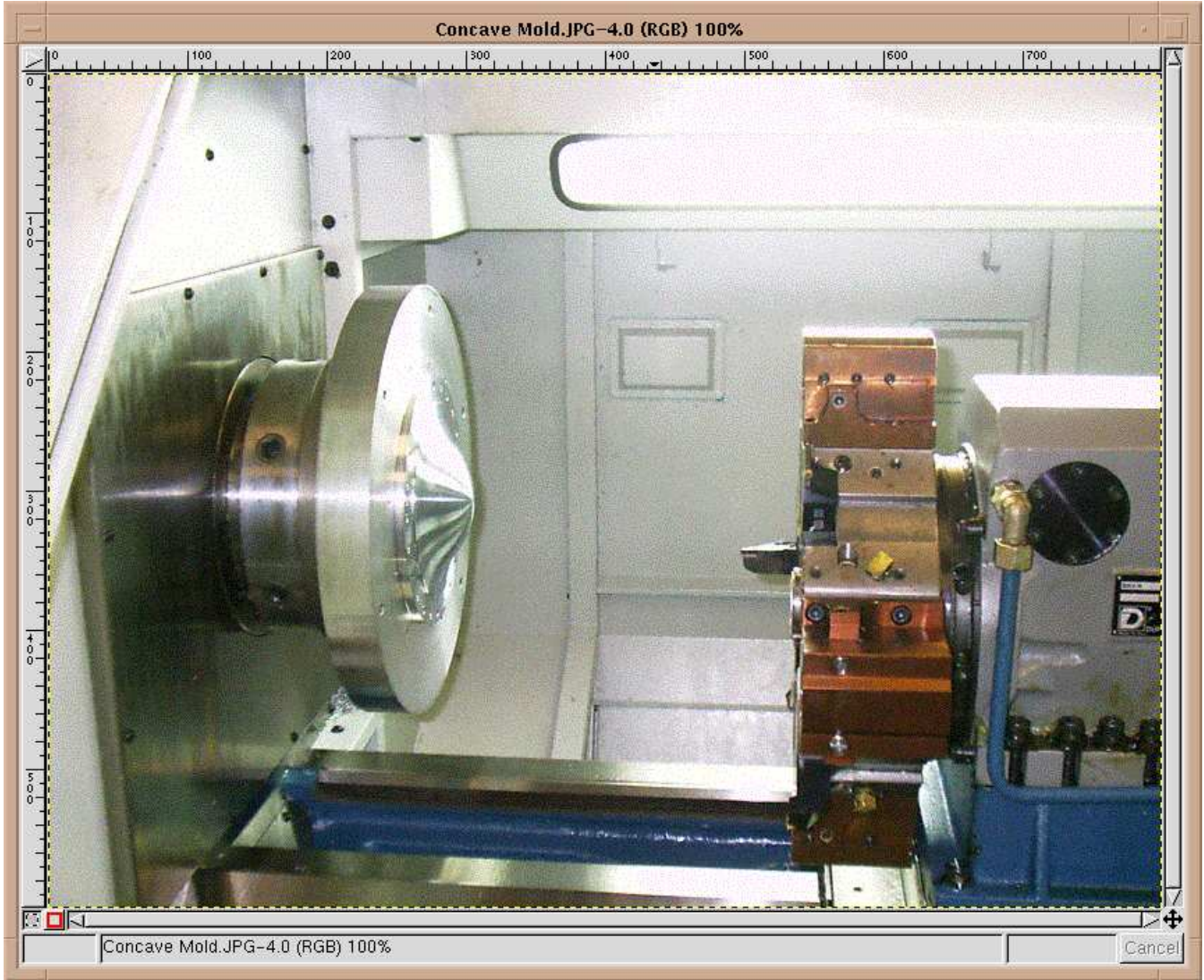
**WH8 Hornet's Nest / WH7X Racetrack  
Wilson Hall**

**Fermi National Accelerator Lab  
Batavia, Illinois 60510**

**17 May 2004**

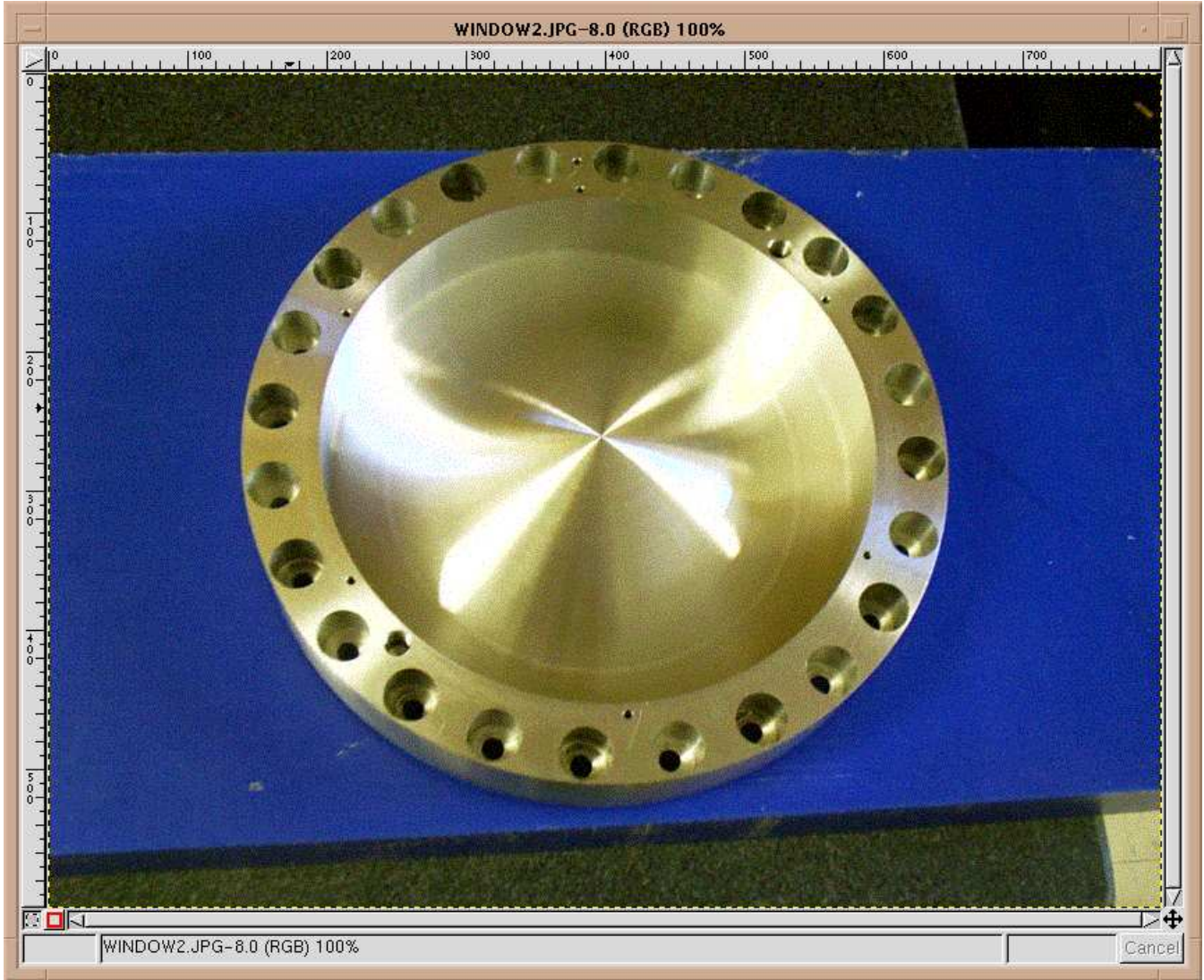
## Manufacturing Thin Aluminum Windows

- Windows contain  $\text{LH}_2$  for muon cooling
- Aluminum Alloy 6061-T6
- New Romi M27 NC Lathe at Mississippi
- Convex backing plate is essential
  
- Two “bellows” windows are now complete



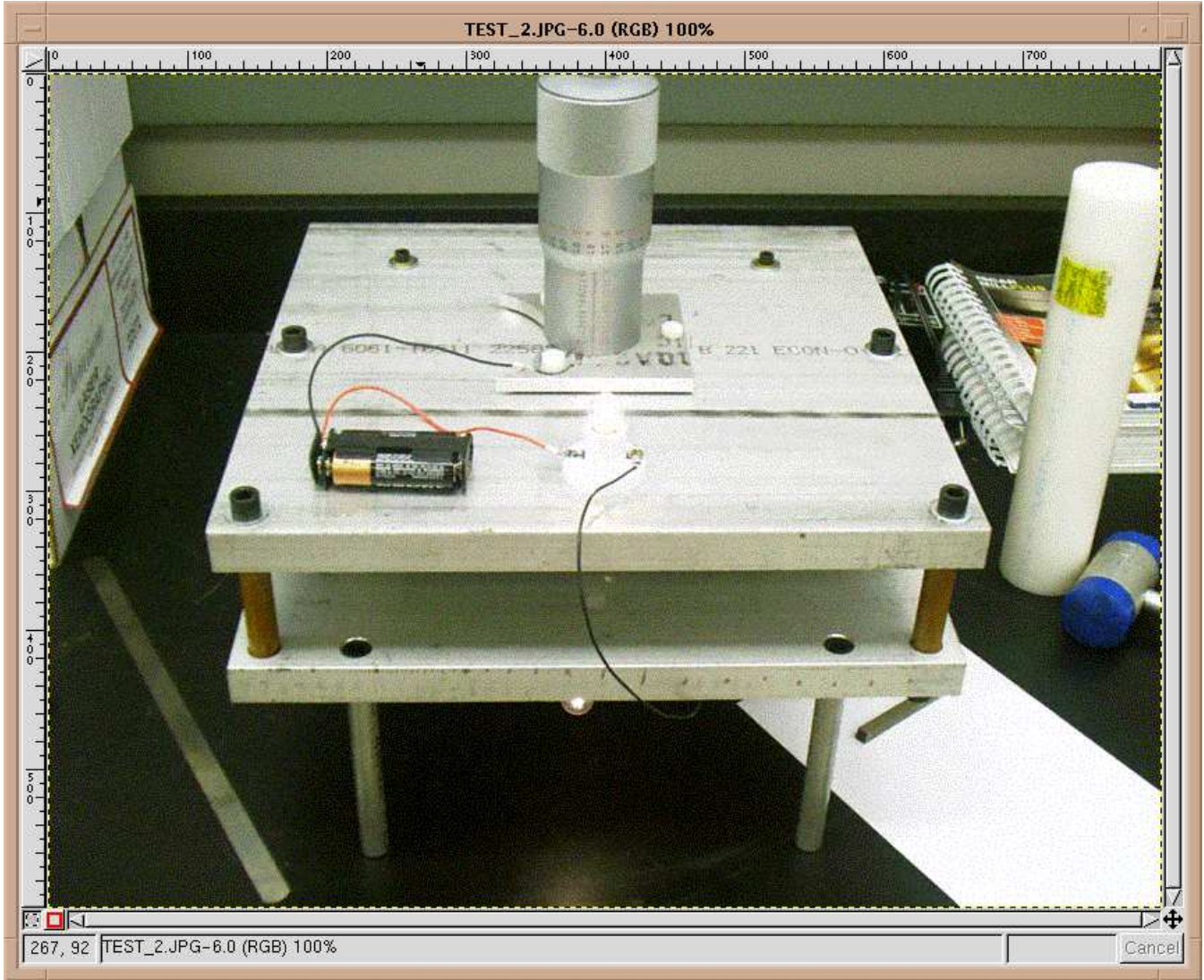






## Measurement: Alvin's Anvil

- Need to confirm NC lathe measurement
- Use two Starrett T468 micrometer heads
- Two inch barrels readout 0.0001" directly
- Electrical contact aids the measurement



## Measurement Result

- Central thickness = 0.0046" = 117 microns
- Future windows
- 2% Lithium – Aluminum / Alloy 2195
- Used in Space Shuttle LH<sub>2</sub> tanks
- 80 ksi vs. 45 ksi 6061-T6 yield strength
- Aluminum is 40% stronger @ 20<sup>0</sup>K
- Additional safety margin
- Need to check for outgassing