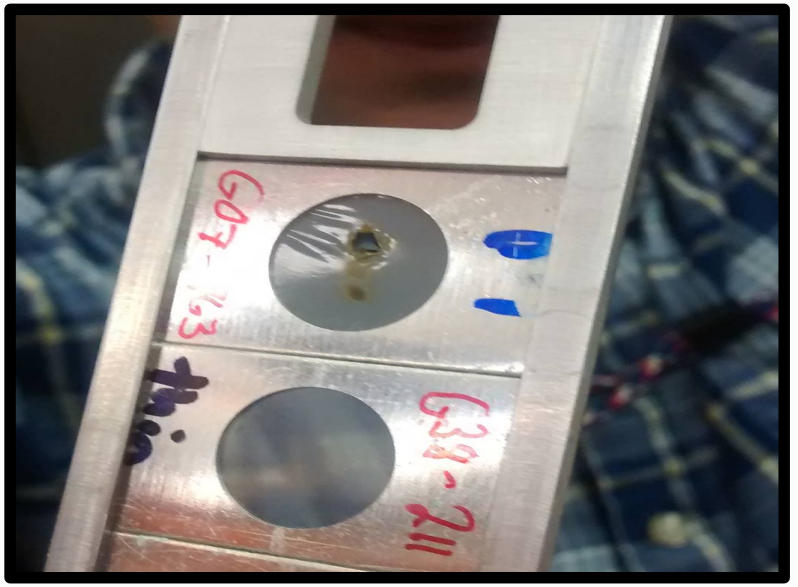
Future Gas Jet Transfer Measurements (JENSA/Gas Jet Working Group)

- A target is needed which is dense, highly localized, and pure – and this is pretty universally true!
  - dense: ~10^{19} nuclei/cm^2 depending on cross section
  - localized: target size ~ beam spot size, and thin to prevent energy loss and straggling
  - pure: free of contaminants & spectator ions
  - robust: target degradation not a problem...



JENSA Letter of Intent (ReA3) – Current Aims

- ^{26}Si(α,α) for (α,p) – x-ray burst light curve, abundance of observable ^{26}Al – ReA3 ok
- ^{30}S(α,p) – x-ray burst energy output and element synthesis – ReA3 ok
- ^{56}Ni(α,p) for 59Cu(p,α) – x-ray burst rp-process and supernova νp-process – ReA3 ok
- *^{56}Ni(d,p) and ^{56}Ni(^{3}He,d) for ^{56}Ni(p,γ) – rp-process waiting point – ReA6/9/12 better*
- *^{30}P(^{3}He,d) – nova nucleosynthesis and presolar grain/nova temperature isotopic ratios – ReA6/9/12 better*

question is optimization:
different arrangements (nozzle, pumping, beam energy, density, etc)
for different goals (capture, resonant reactions, transfer, etc)

Future Hopes/Plans – Optimization/Expansion

- support for continued JENSA standalone measurements in the SECAR era
  - requires some infrastructure modifications to make this easier
  - also run a hybrid JENSA+SECAR mode?
- gas jet target in the ReA6/9/12 hall for ~near Coulomb barrier transfer reaction measurements (ReA3 limited to ~5-6 MeV/u)
  - standalone vs ISLA target location, maybe make it "portable"
  - can we make/use a gas jet for/with GRETA? with the HRS?
- gas jet target in a fast beam hall like S2? (anywhere CH_2 used and the C is a problem...)
- gas jet target at ANL on a beamline with in-flight and CARIBU beams available?
- smaller gas jet target at university lab(s)? (ND, FSU...)
  - single-pass or cheap compressor
  - target location of one of the resurrected split poles?