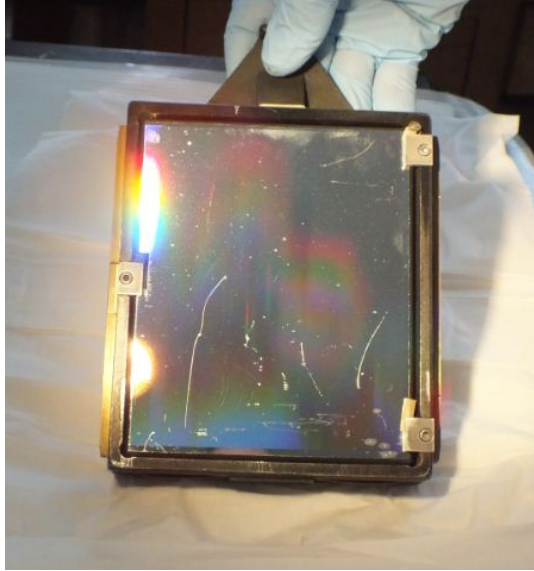


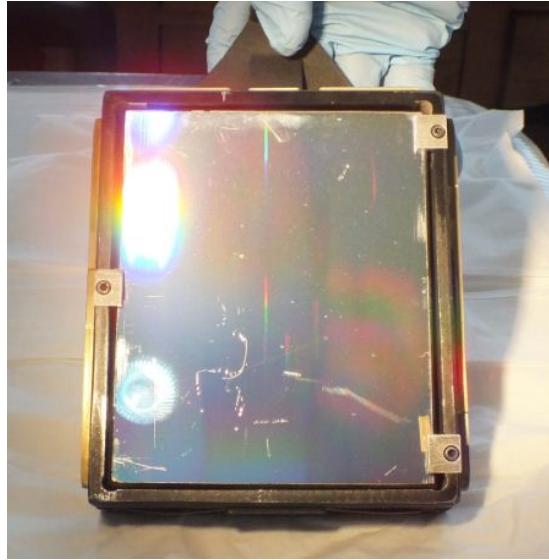
Mt. Hamilton Optics Cleaning Trip
David Hilyard and Brian DuPraw
8/17/12

KAST Gratings

The KAST gratings seemed little changed from the last time they were inspected... most had a few scratches. Cleaning was limited to blowing them off with canned air, however.



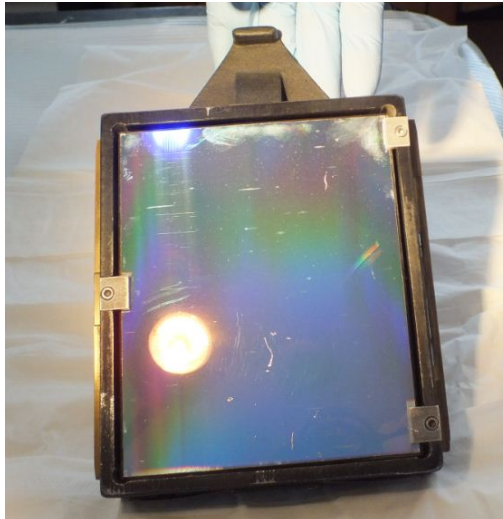
Grating 1 - 5000 A, 600 line/mm



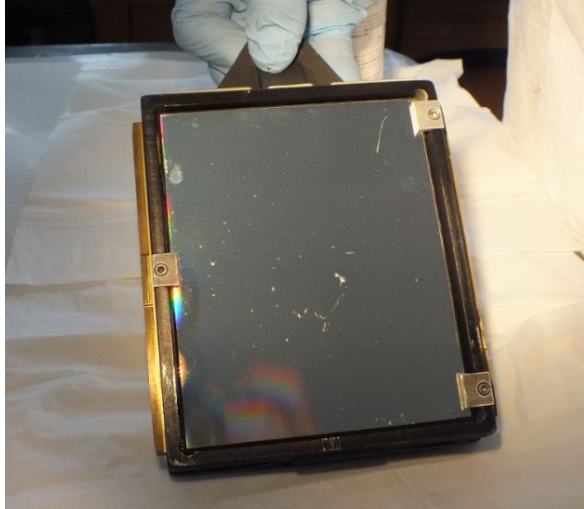
Grating 2 - 7500 A, 600 line/mm



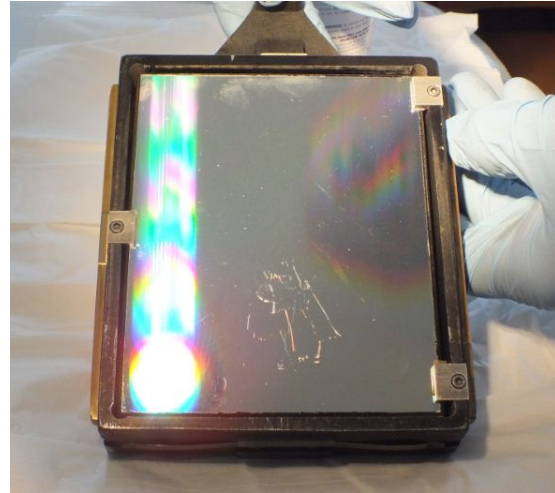
Grating 3 - 8457 A, 830 line/mm



Grating 4 - 5000 A, 1200 line/mm



Grating 5 - 4230 A, 300 line/mm



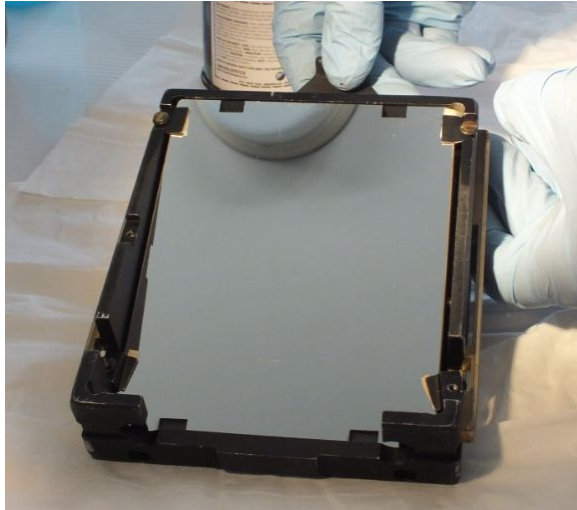
Grating 6 - 7500 A, 300 line/mm



Grating 7 - 3000 A, 600 line/mm

KAST Mirrors

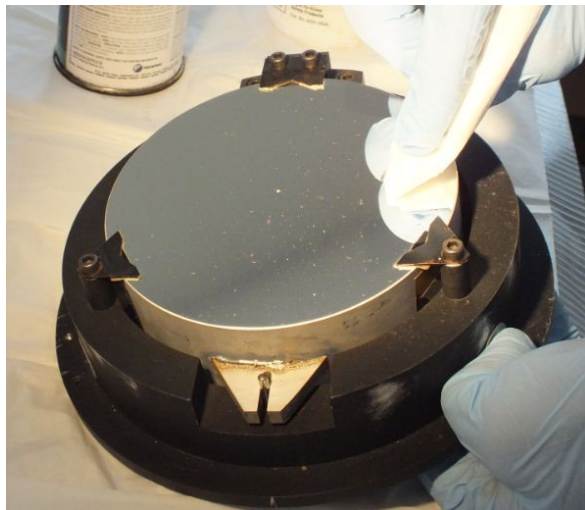
The KAST flat mirror had some fingerprints along the top edge but Dave was able to clean them with ethanol and acetone. The round collimator mirror was dusty and also had some surface spots so Dave attempted to clean it with acetone on a Kaydry; however, he stopped when it became apparent that the coating was too soft to stand up to cleaning.



KAST Flat Mirror – Cleanable



KAST Collimator



KAST Collimator – Cleaning Attempt

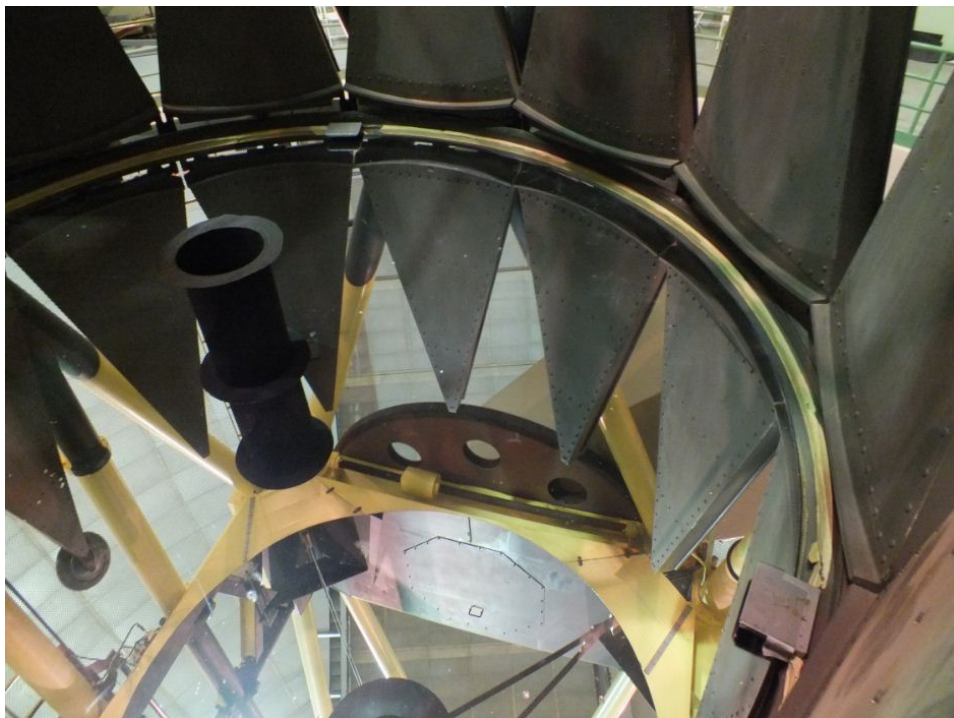


Cleaning Stopped due to streaks forming

120" Primary

The 120" primary mirror had a 12" long oil streak which was luckily close enough to the edge of the mirror that Dave was able to clean it. (No small feat, anyway, given the way the pie-shaped cover segments form a fence around the mirror when they're open). Other than the oil spot the mirror condition looked pretty good. After he cleaned the oil spot we measured 88% reflectivity in the blue and 96% in the red (relative to the reference mirror).

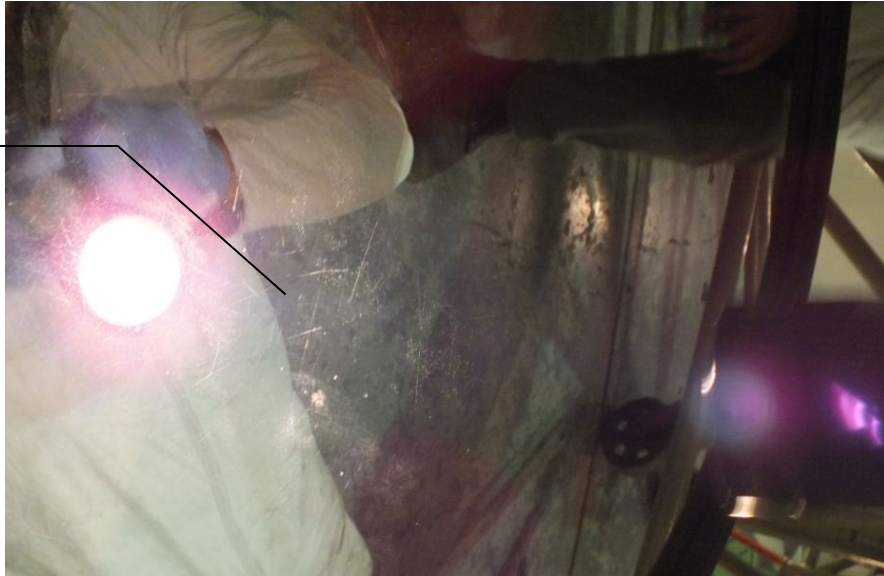
Oil Spot



120" Coude Secondary

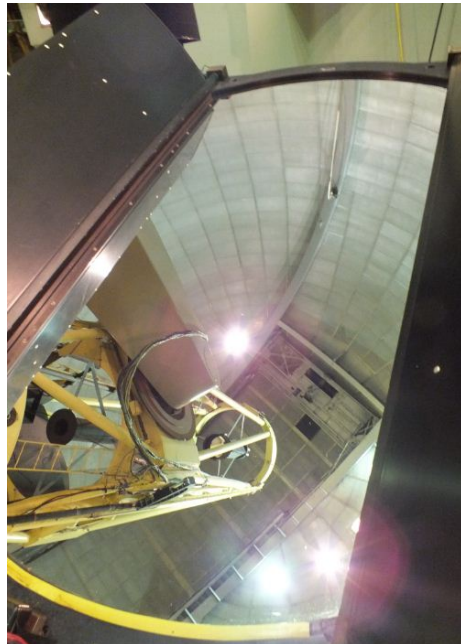
The Coude secondary mirror had a lot of spots in the coating itself. Dave tried cleaning an area and, although it didn't sleek the mirror, neither did it help. We measured 87% reflectivity in the red and 90% in the blue.

Poor
surface



120" Telescope's M3

The third mirror in the Coude chain was the large flat mirror often found in its fixture on the dome floor. It looked good, though a little dusty, so Dave blew the surface off with canned air. We measured 91% reflectivity in the red and 90% in the blue.



CAT Mirrors

The Coude Auxiliary Telescope's primary mirror is difficult to access but is usually found to be dirty since it faces straight up. Dave cleaned it with de-ionized water on a Kaydry, followed by ethanol. Then he used acetone to cut any streaks the ethanol might have left, even though the limited visibility available made their presence just an assumption. The small opening in the side cover also makes it risky to measure the reflectivity so we didn't do that this time. However, the downward-facing secondary was measured to have 58% reflectivity in the blue and 61% in the red. It has always had very low reflectivity numbers.



The flat turning mirror didn't need cleaning. It was measured to have 100% reflectivity in the red and 92% in the blue (relative to the reference mirror).

Dave did clean the upward-facing lens, which had been dusty.

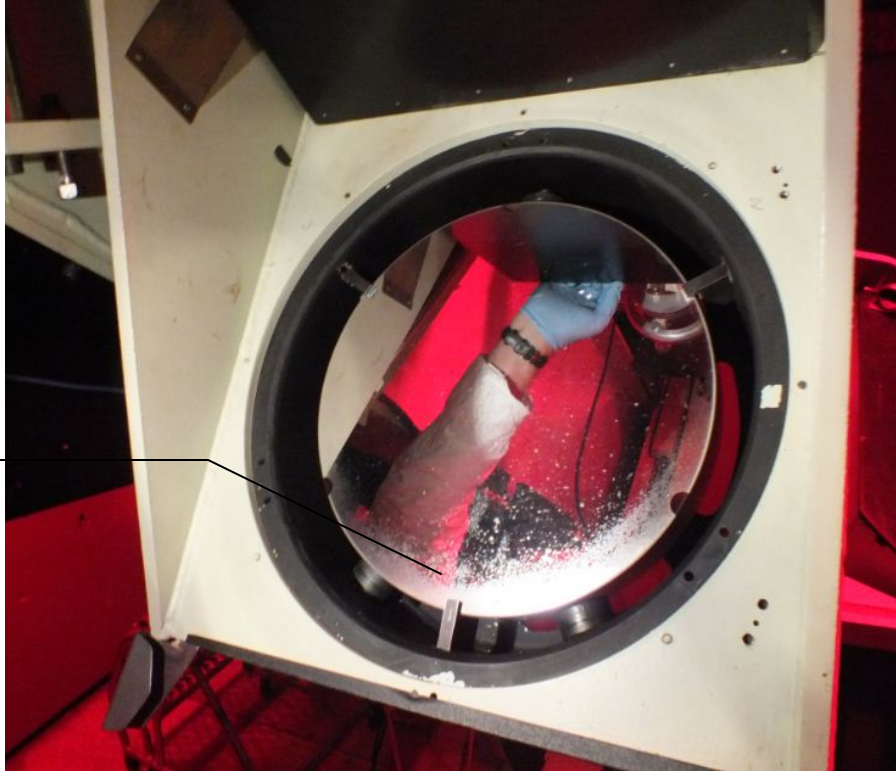
The large siderostat, accessible from outside the dome, was not too bad, overall, (no mouse prints), but could stand to benefit from cleaning so Dave did just that. He sprayed on de-ionized water and then dabbed on an Orvus/acetone/H₂O mix, followed by ethanol. Afterward we measured 89% reflectivity in the blue and 88% in the red.



Hamilton Camera

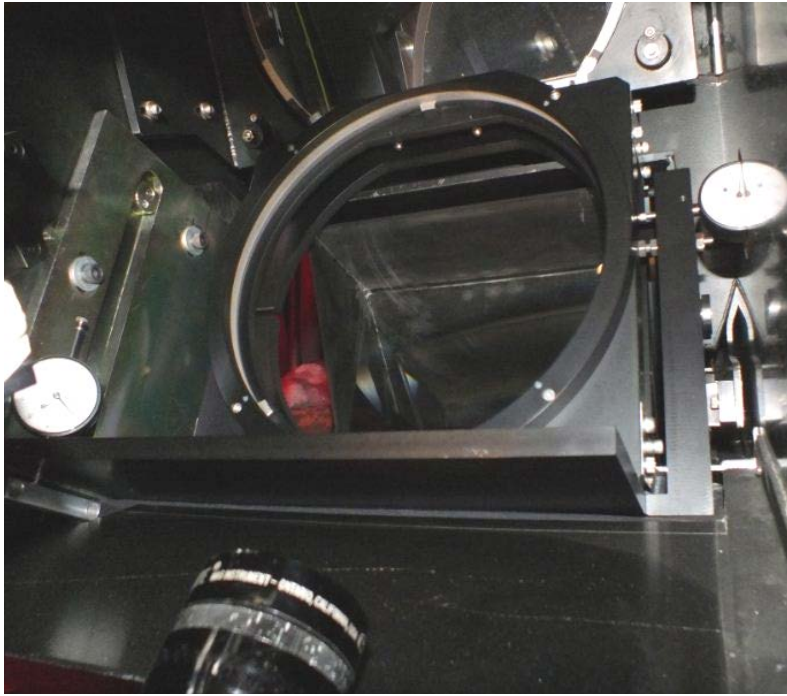
The Hamilton Collimator usually is seen to have surface discoloration on the right side. This time we saw new and fairly severe degradation of the coating, seeming to be working its way in from the bottom edge upward. It was clearly not the sort of degradation that could be cleaned away.

Severe
edge
degradation

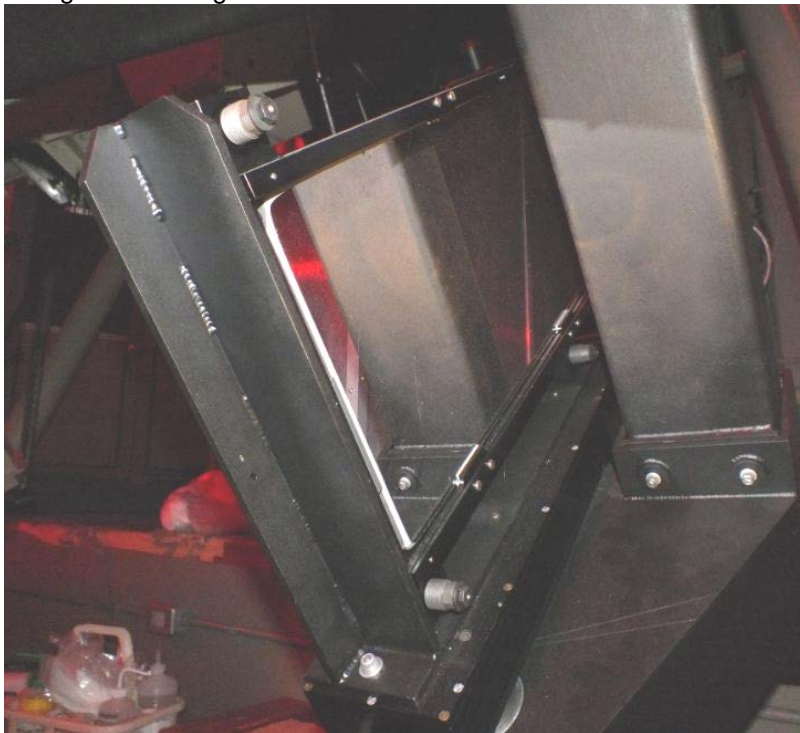


Dave inspected other components of the camera, such as the prisms, mirror and an easily-sleeked lens. They were all blown off with canned air.





This flat mirror benefited from being blown off, but when a tiny area was cleaned it was immediately apparent that the coating was too fragile to continue.

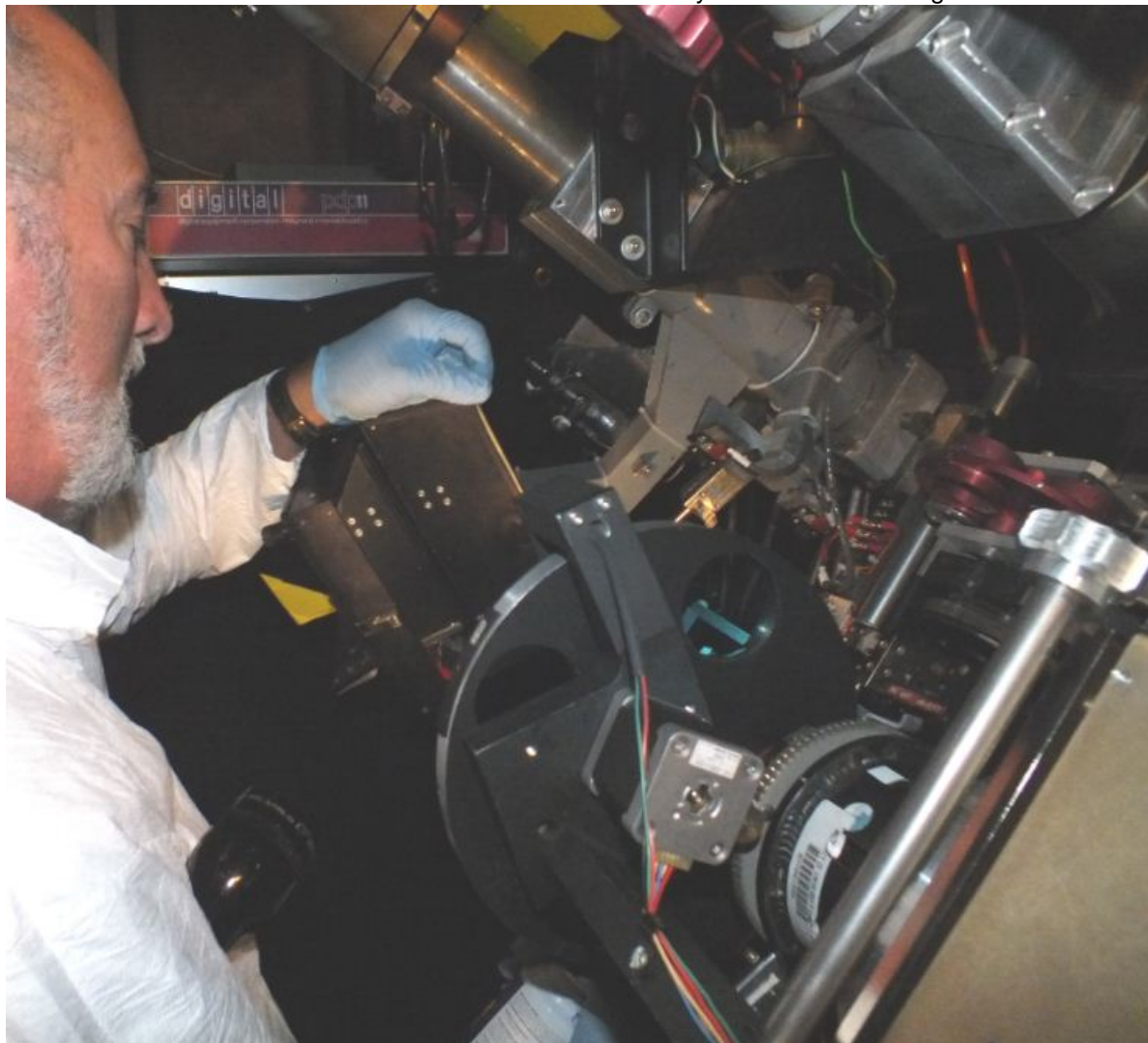


There was one mirror that had always been covered and we had never looked at before. This time we opened the cover to inspect it and found it was a little dusty but in good condition. Later we asked Kostas about it and he said that mirror was not in general use.



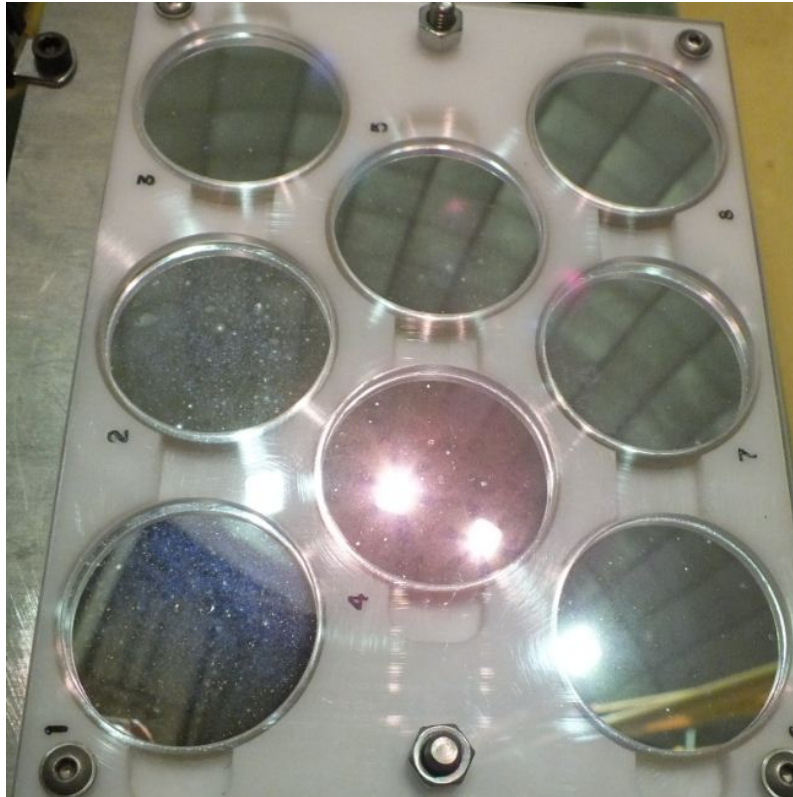
Slit Room

In the slit room Dave blew off a number of surfaces but they didn't need cleaning with solvent.



Coating Samples

The protected silver coating samples we had made in Santa Cruz had been brought down from the mountain a couple of months prior to this trip for a closer inspection, and then returned for the past month or so. In general they were holding up very well. We were informed that they had been CO₂ cleaned a couple of days ago.



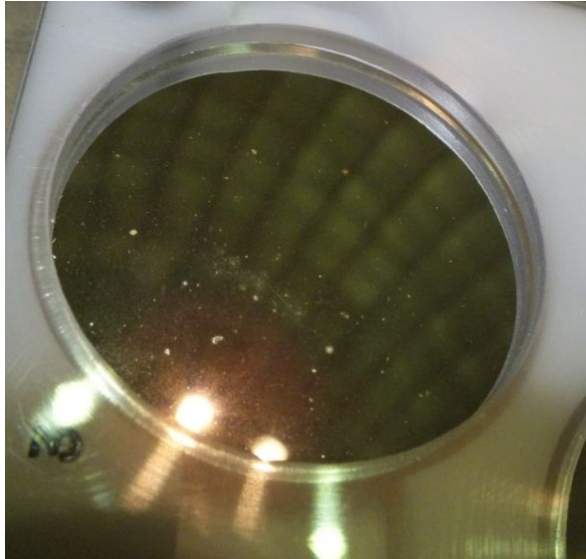
Of the eight samples in the top half of the rack, most had a few nuclei of degradation. Disks 7 and 8 had the least nucleation sites but had an overall scattering haze. Disks 1 and 2 seemed to have both.



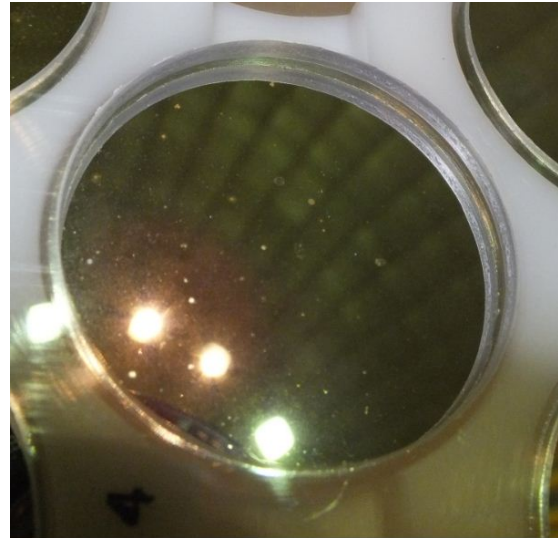
Coating Sample 1



Coating Sample 2



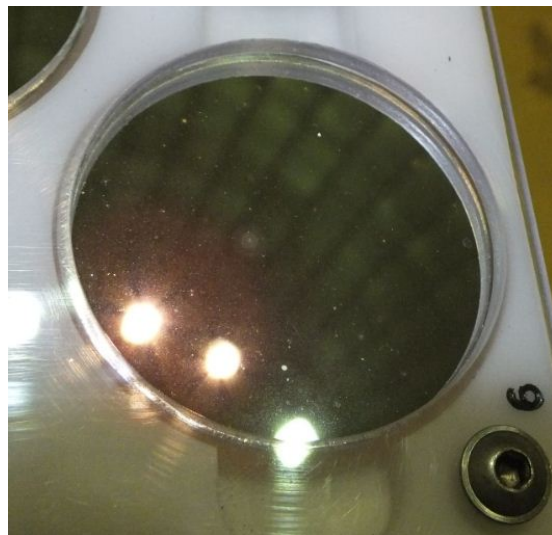
Coating Sample 3



Coating Sample 4



Coating Sample 5



Coating Sample 6



Coating Sample 7



Coating Sample 8