

BigBOSS and Fermilab

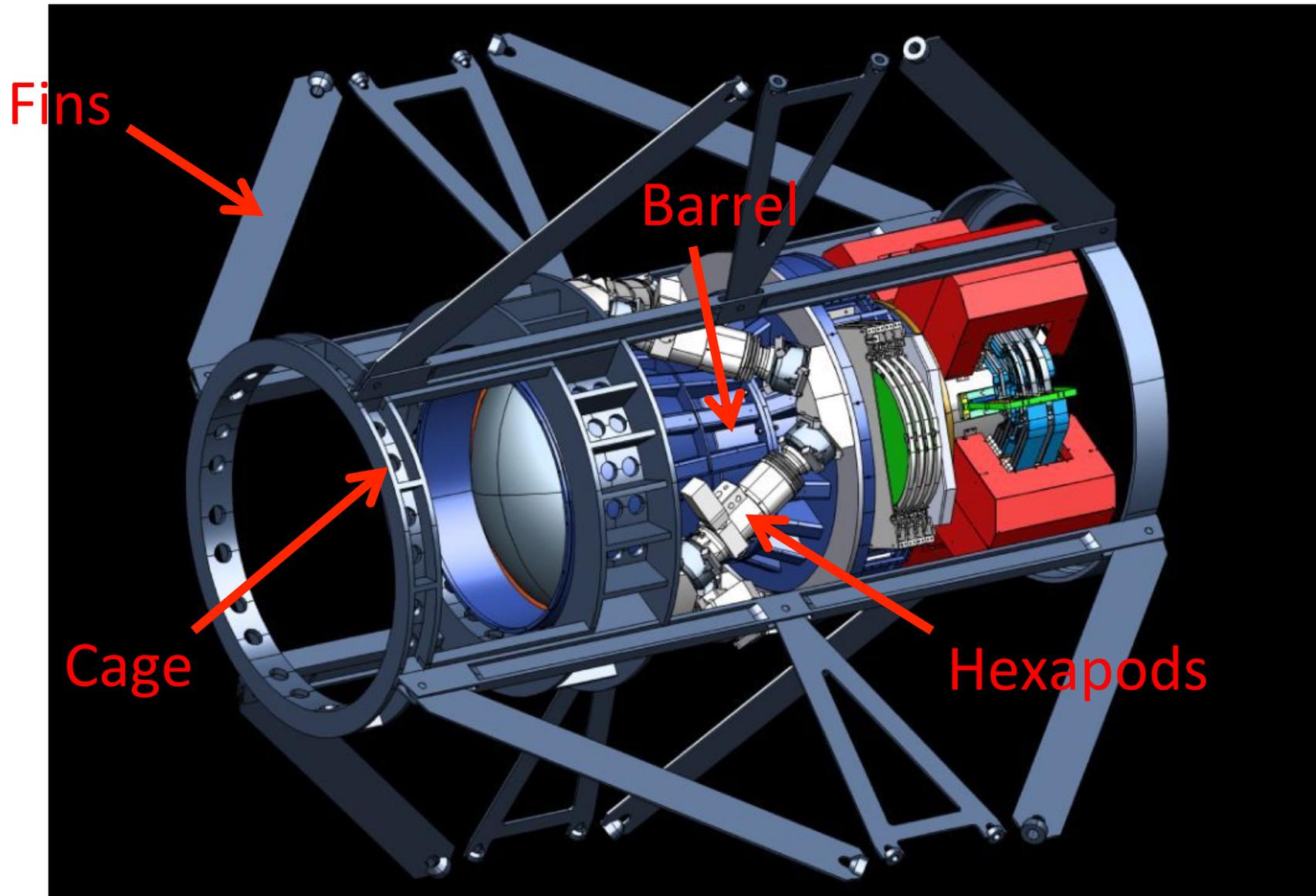
Gaston Gutierrez

Fermilab

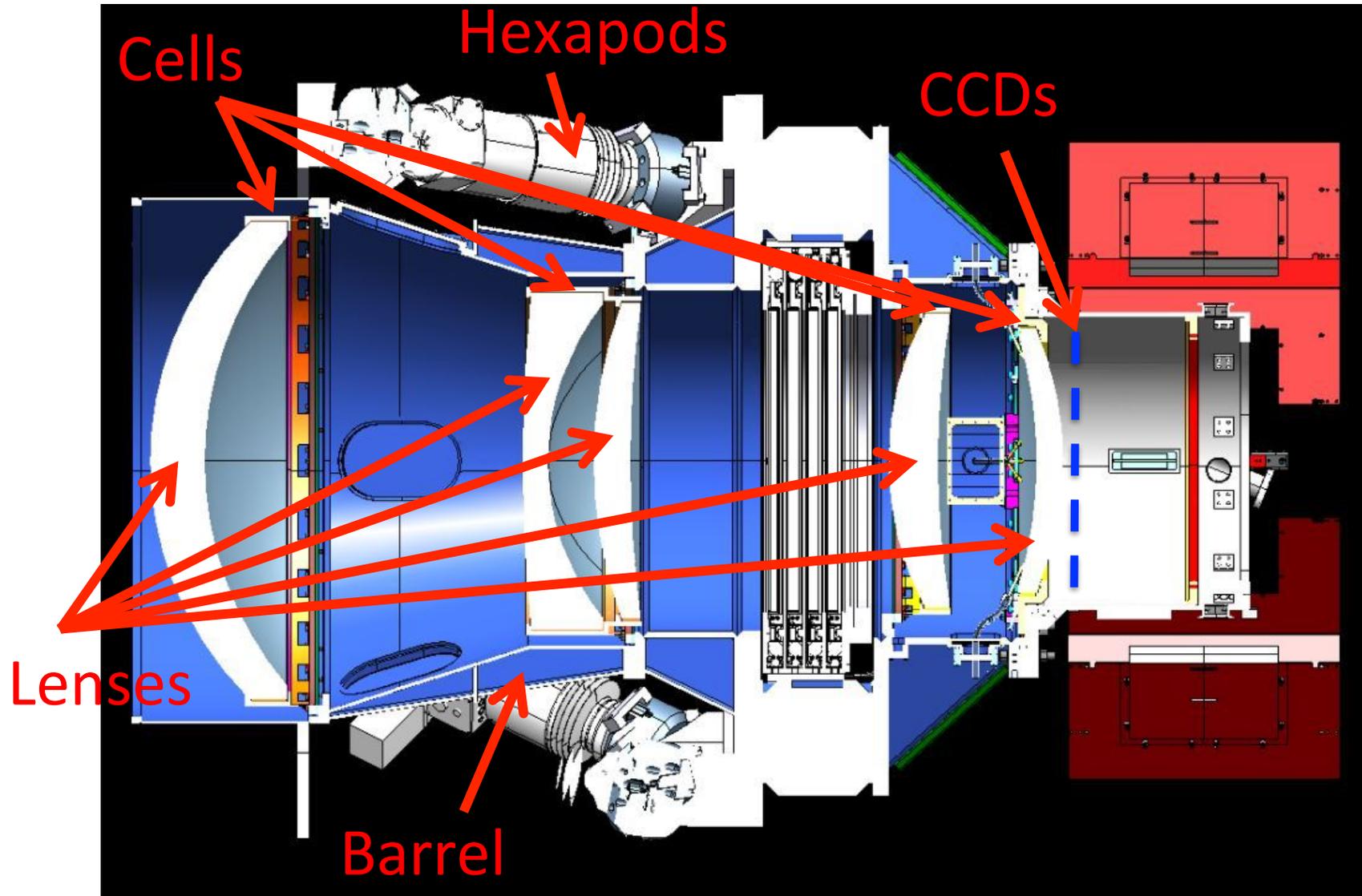
PAC meeting 16-oct-2012

- DES telescope top end (fins, cage, barrel ...).
- Fermilab and BigBOSS's telescope top end.
- DES CCD packaging and testing.
- Fermilab and BigBOSS CCDs.

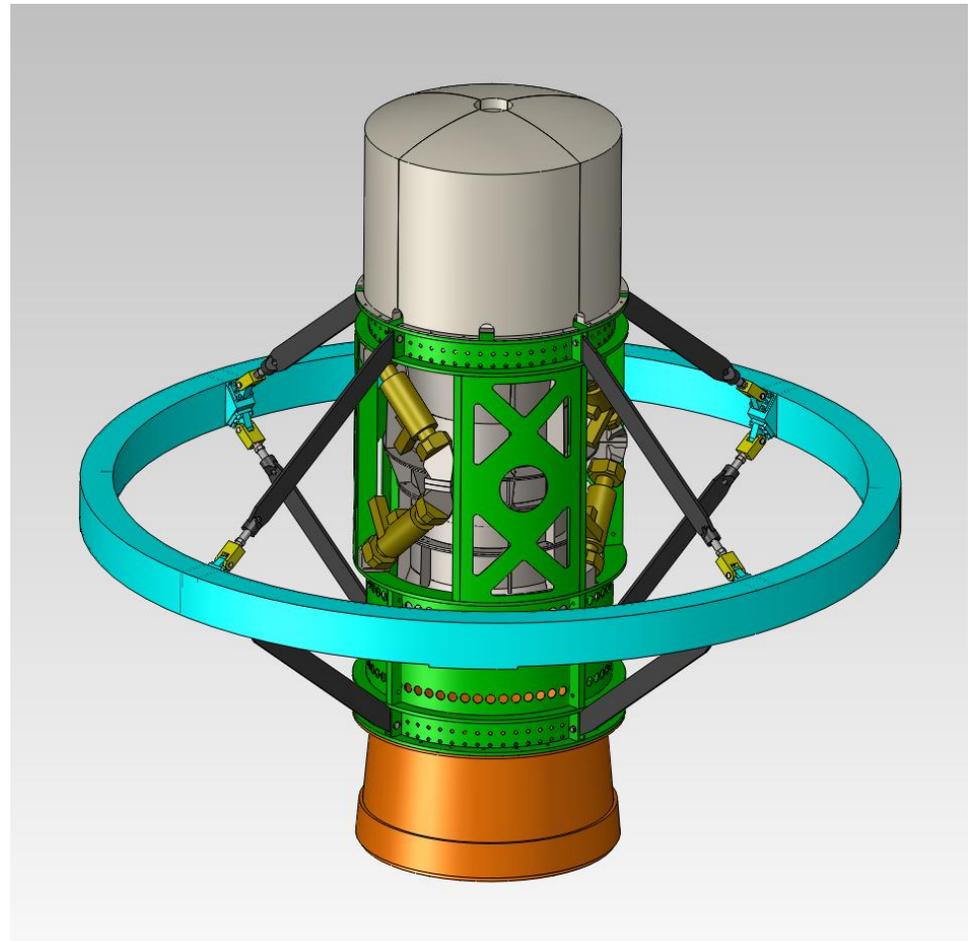
DES: telescope's top end



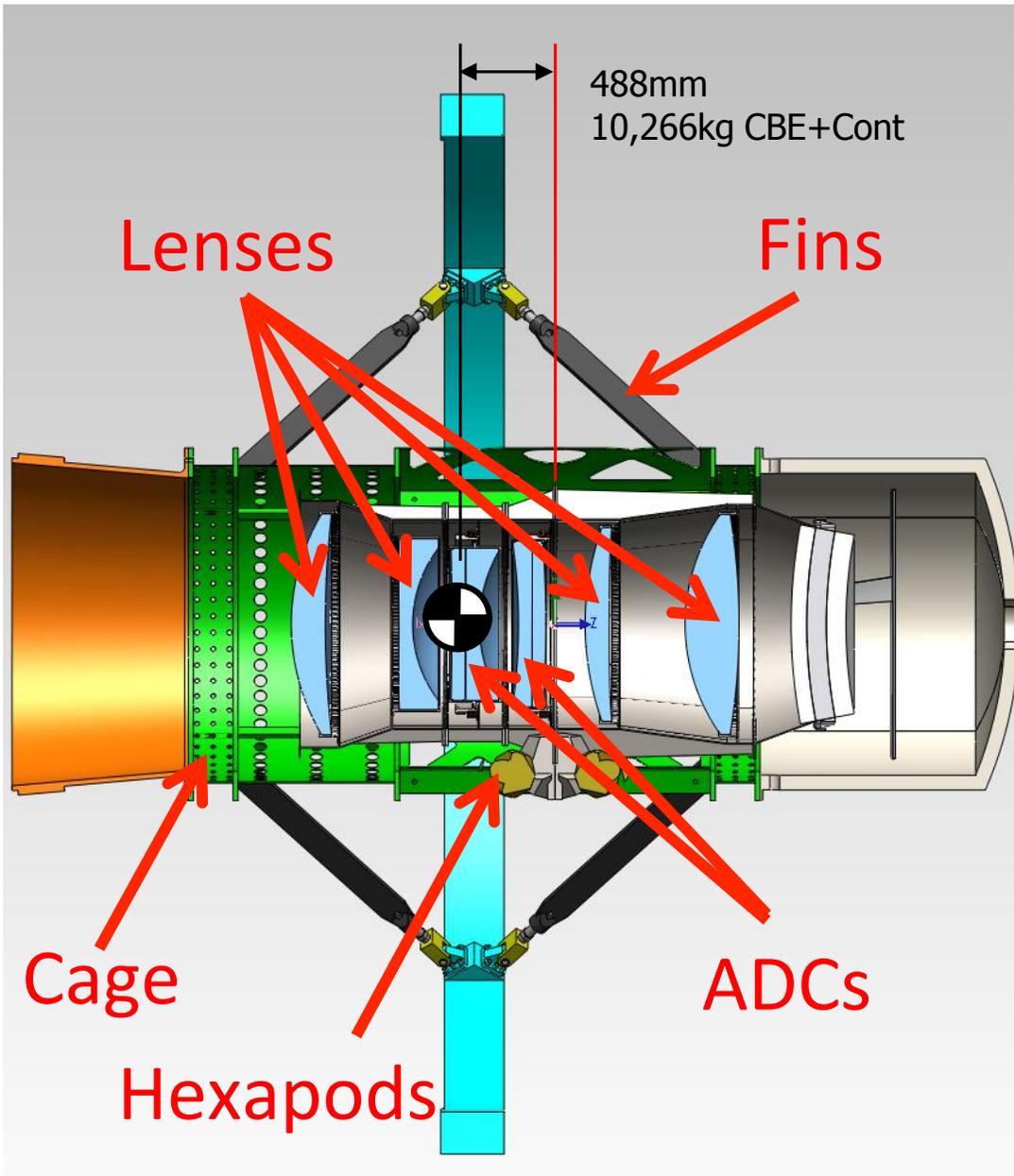
DES: corrector



BigBOSS: telescope's top end



BigBOSS: corrector



The CCDs for BigBOSS will now be part of the spectrograph

BigBOSS at Fermilab: a natural extension of DES



← Top ring, fins and cage



Final alignment →

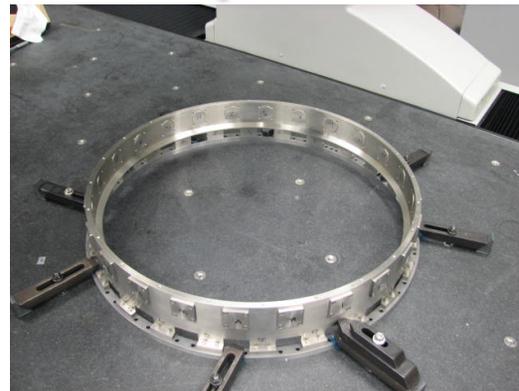
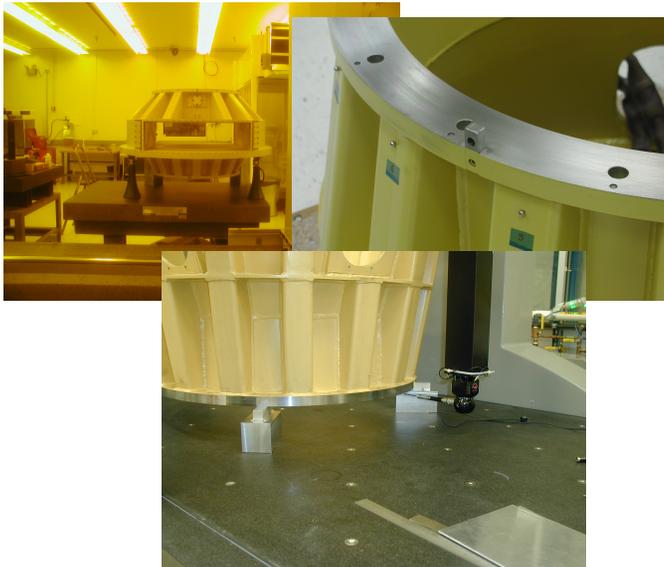


← Hexapods

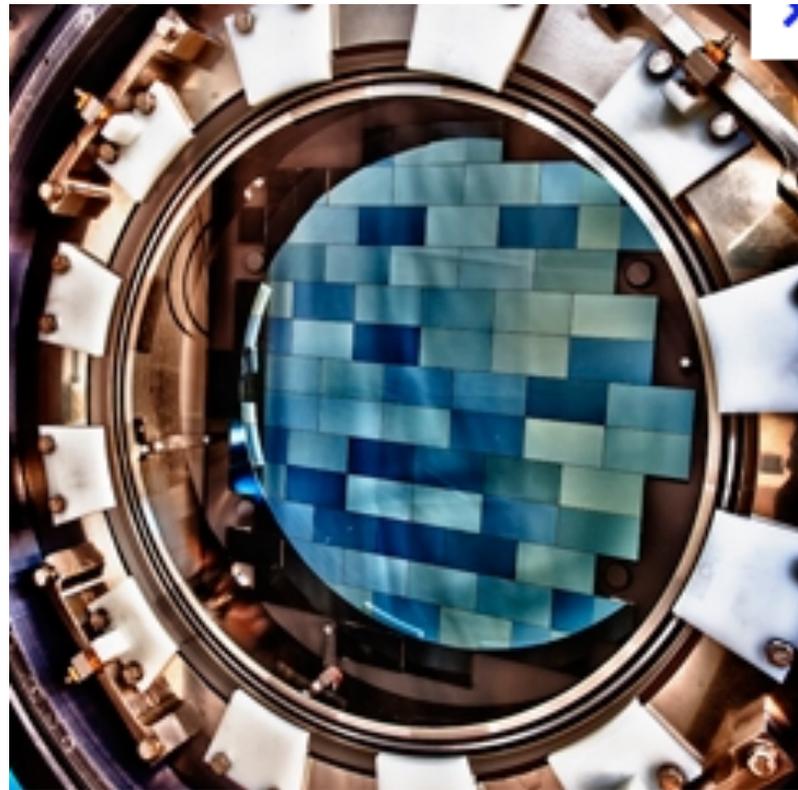
Barrel construction



Cell characterization



74 CCDs in DECam focal plane were produced at LBNL and later packaged and tested at FNAL.



We are now setting up for doing the same for the BigBOSS CCDs.

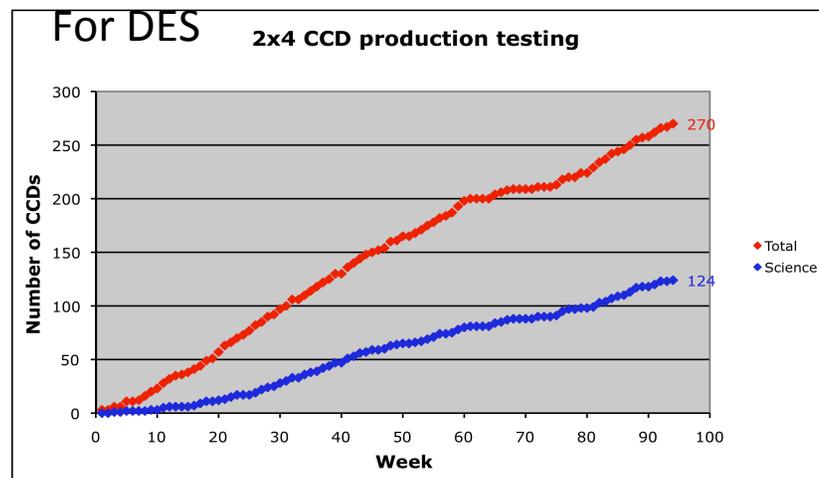
CCD packaging and characterization



Now we are adopting the new packaging design from LBNL for the 4kx4k CCDs and expect to be ready to start producing BigBOSS CCDs in April-2013.



FNAL has established a CCD packaging and characterization factory. In 2 years cycled more than 300 CCDs through this facility.



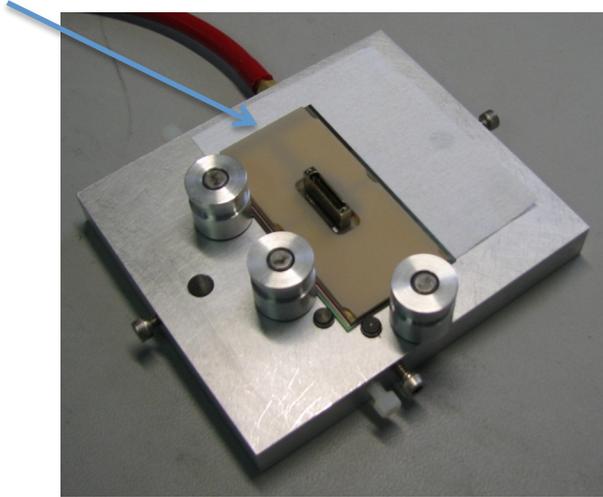
CCD testing lab, software and database will also be adapted for the BigBOSS CCDs.

4CCD/week testing and production rate is possible if needed.

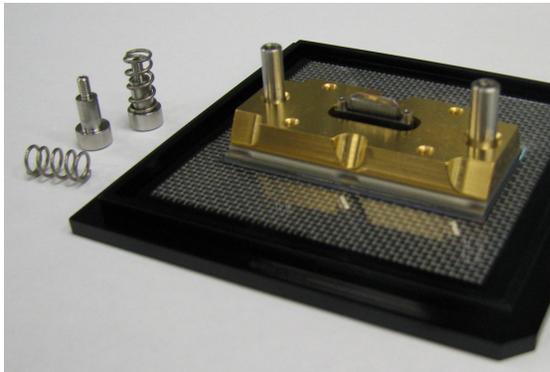
DECam CCD package

Those 6 pieces of tape are then visible on the images.

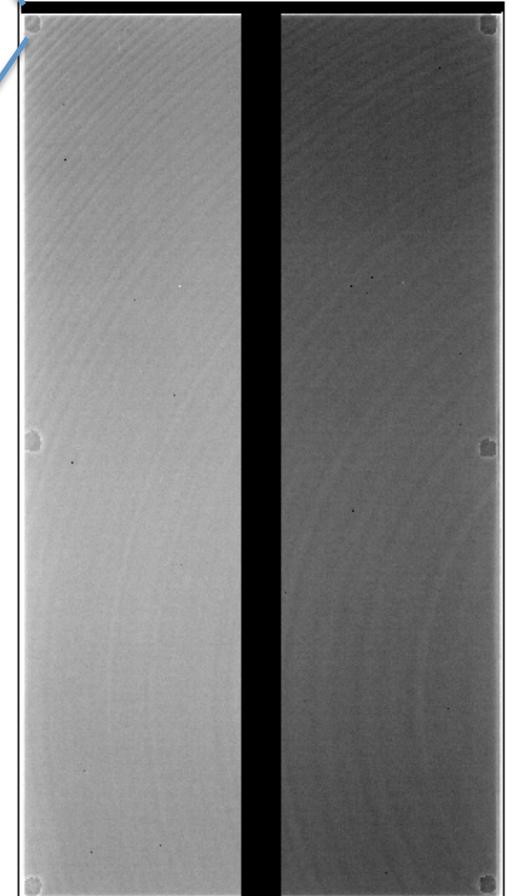
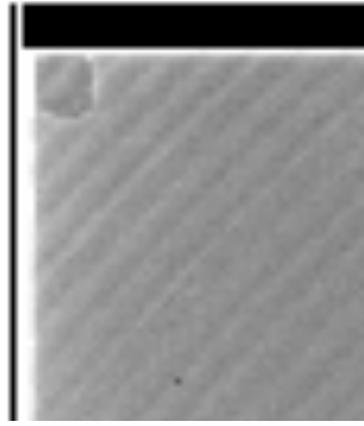
AIN board:



Locate AIN on CCD, tacked in place with 6 tiny squares of double-stick tape.



The foot is then attached to this assembly.



For the BigBOSS packages we want to eliminate this cosmetic issue.

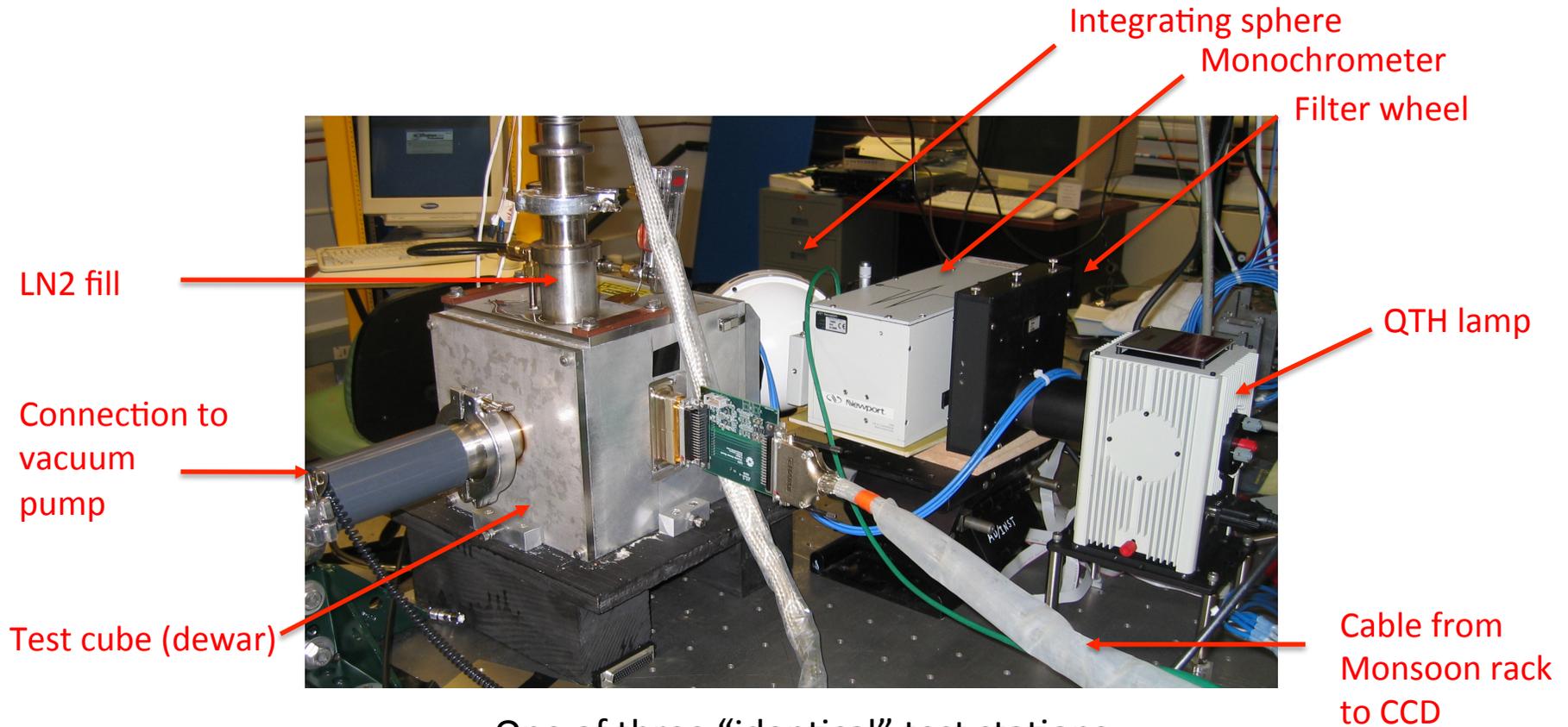
Our colleagues at LBNL have developed a new packaging procedure that eliminates the tape, and sets the gap between the CCD and the board using microscopes and micrometers. We are now implementing this procedure in our CCD testing/packaging factory at FNAL.

The procedure also has tight control of the process, which should make the gluing steps more consistent and with less chances of voids.



Packaging station at LBNL. Coming soon to FNAL

DECam test stations to be re-used for the production testing of BigBOSS CCDs.



One of three “identical” test stations

Testing electronics, database and automated testing software to be adapted to the BigBOSS detectors. Technical expertise and facilities developed at FNAL for this work during DECcam will be an excellent fit to this job.

Conclusions

- For BigBOSS Fermilab will contribute to the design, construction and alignment of the top end ring, fins, cage, hexapods and barrel and to the packaging and testing of CCDs.
- The technical expertise and facilities developed at FNAL for DECam CCDs combined with the CCD experience from LBNL make an ideal match for the BigBOSS CCD work.
- The BigBOSS work is a natural extension of the work we did for DES.
- As with everything else, these will be a lot of work but we don't expect big risks.