Alliance Of Historic Observatories
Rome 4 October 2024

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Digitizing and making accessible the original plates of the Barnard-Calvert *Photographic Atlas of Selected Regions of the Milky Way*

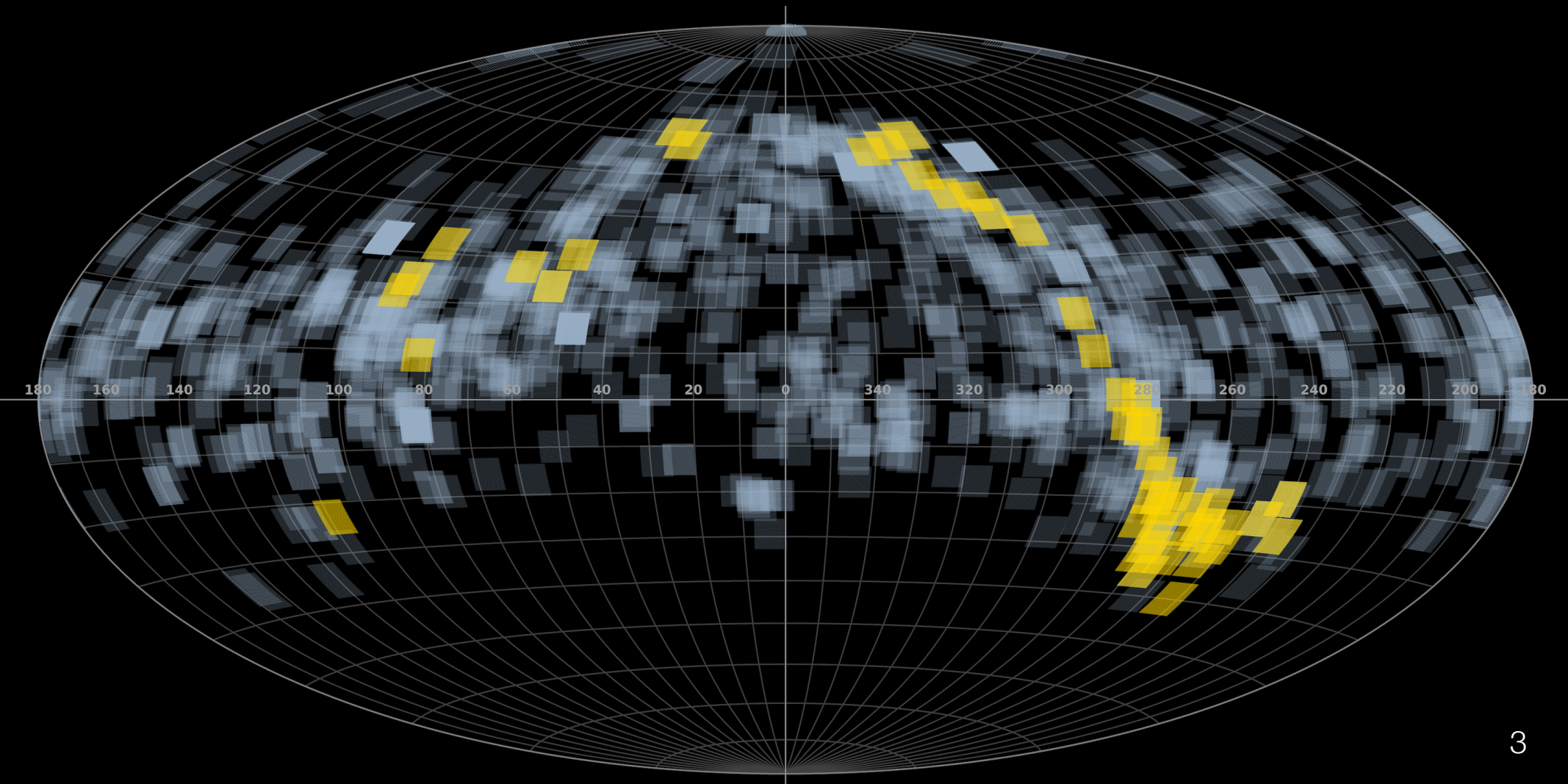
An example of UChicago undergraduate engagement with assets from Yerkes Observatory

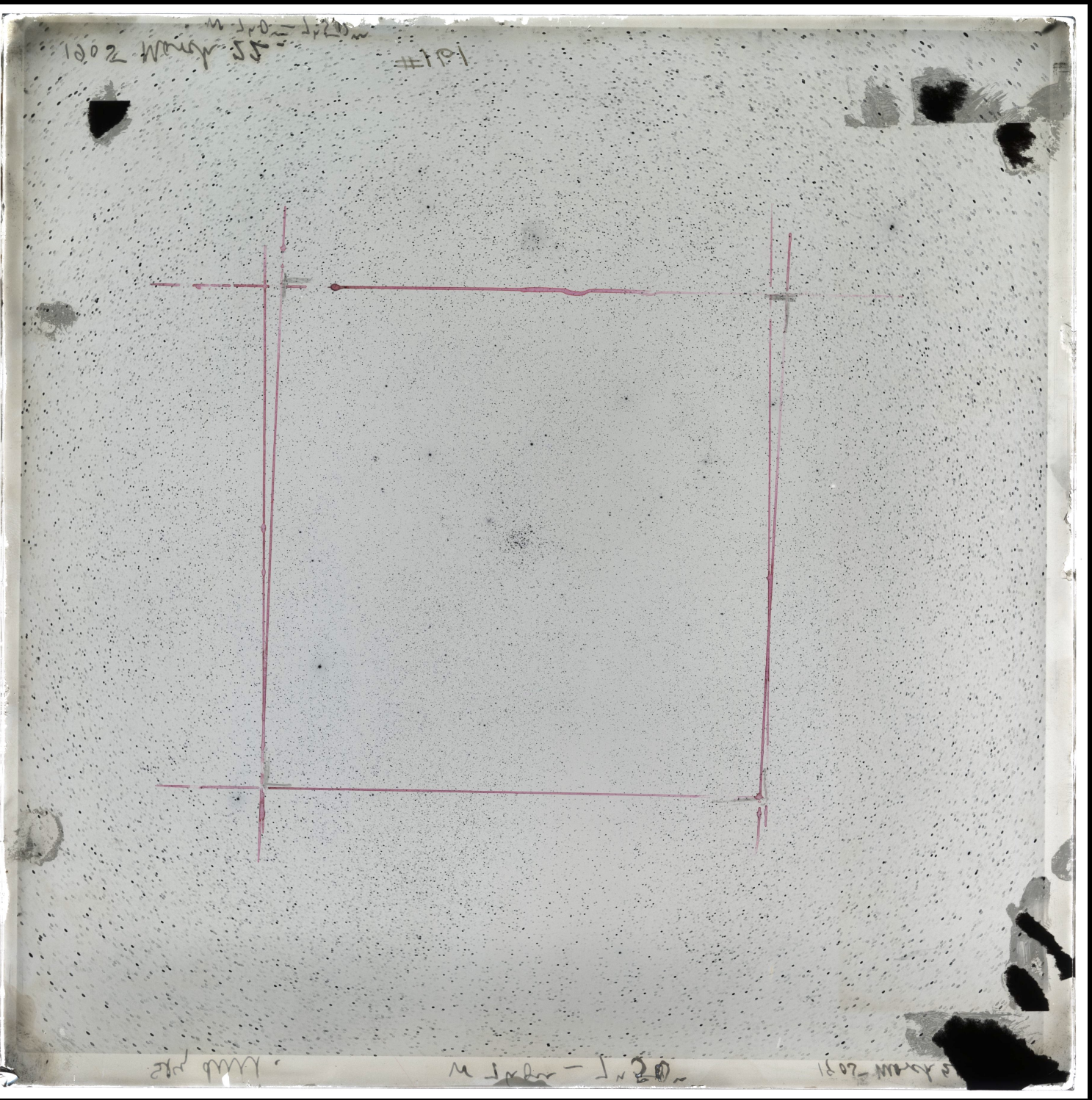
Bruce telescope at
Mt. Wilson 1905
(40 plates)

Yerkes Observatory
1906 - 1916
(9 plates)

yellow: 49 plates that comprise the *Atlas*
blue-grey: all other plates in the 10B series

plates are 30 × 30 cm, 13.6 deg on a side;
depicted here: 6.5 deg on a side

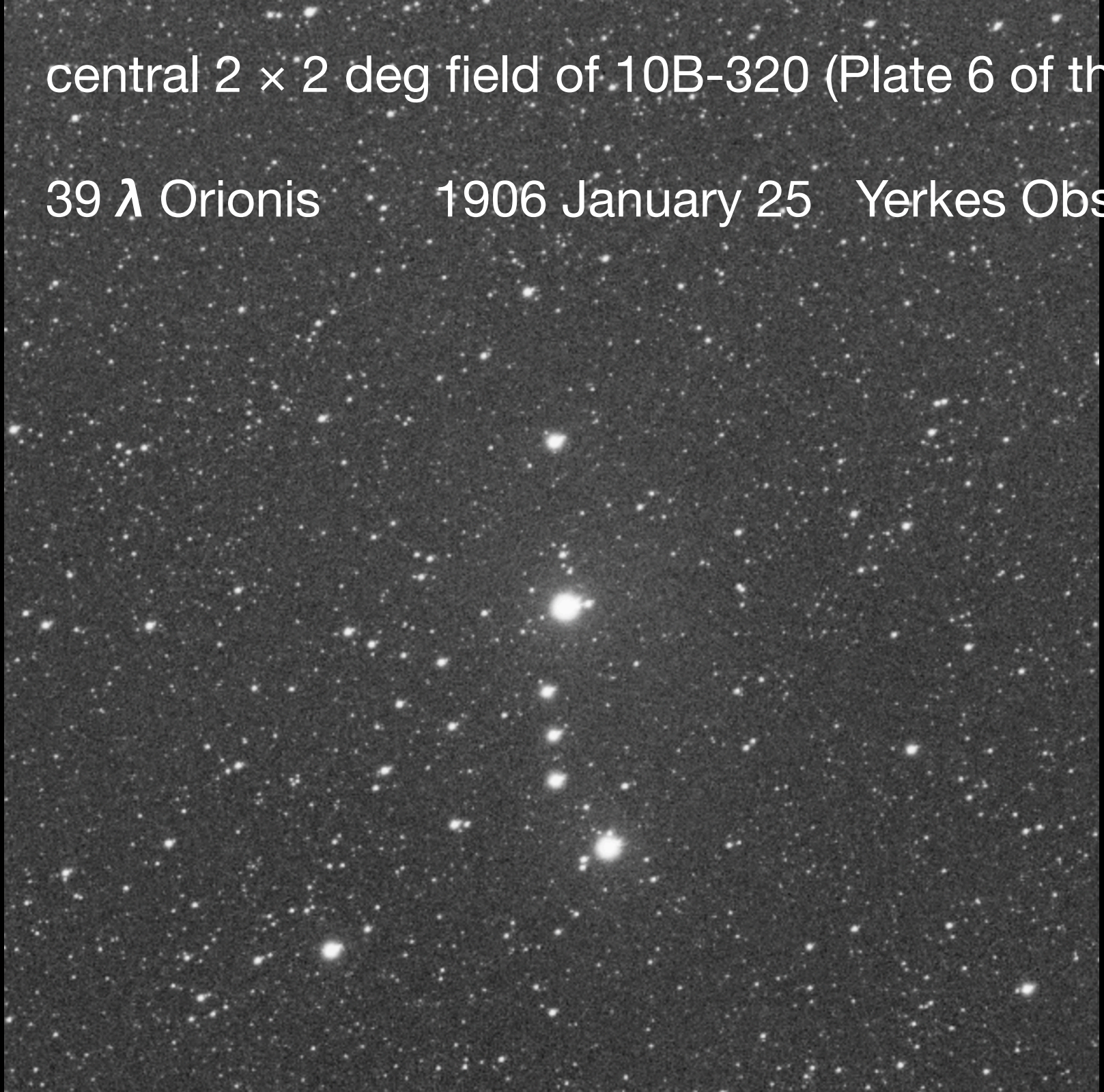




10B-161 (Plate 8 of the *Atlas*)

central star cluster is Messier 35

red square annotation is about 6.5 deg on a side



central 2 × 2 deg field of 10B-320 (Plate 6 of the *Atlas*)

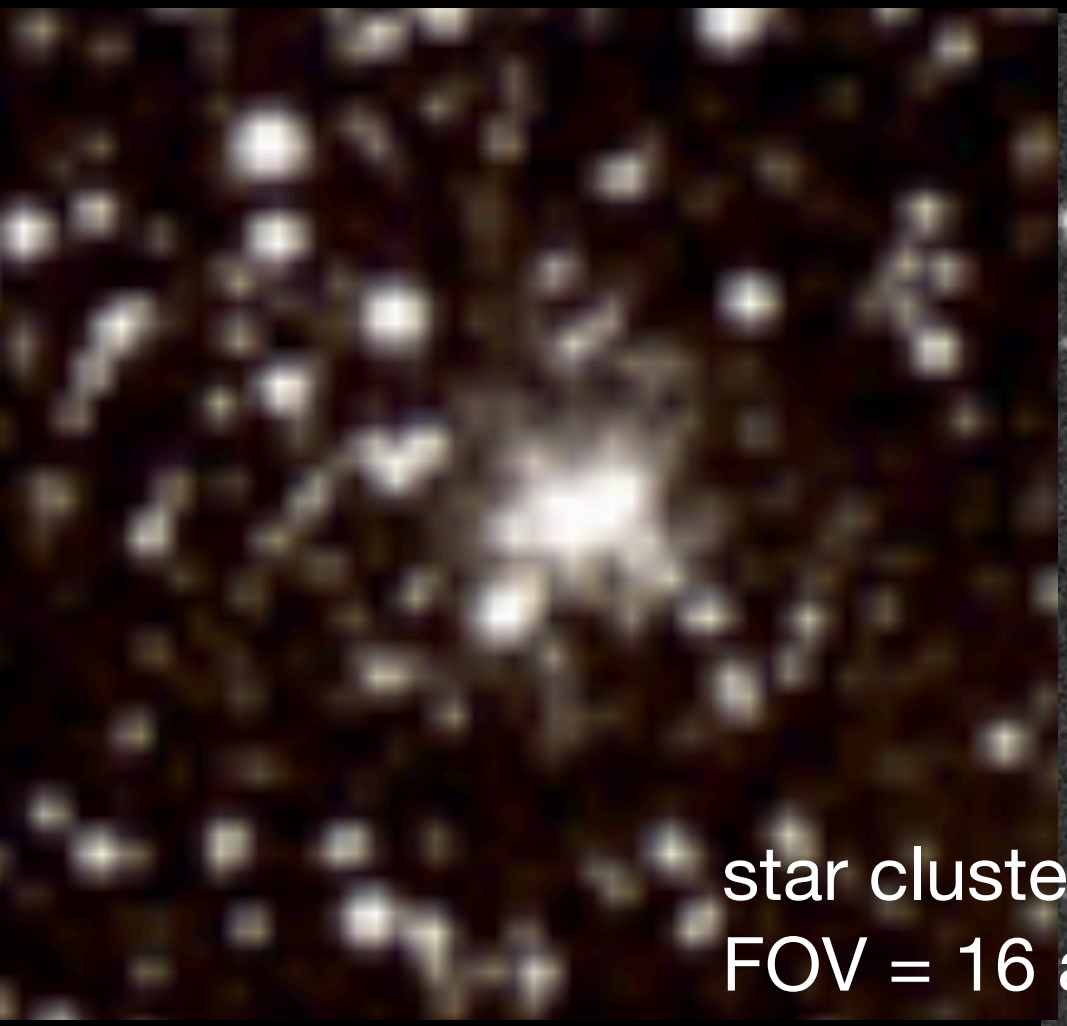
39 **λ** Orionis 1906 January 25 Yerkes Observatory

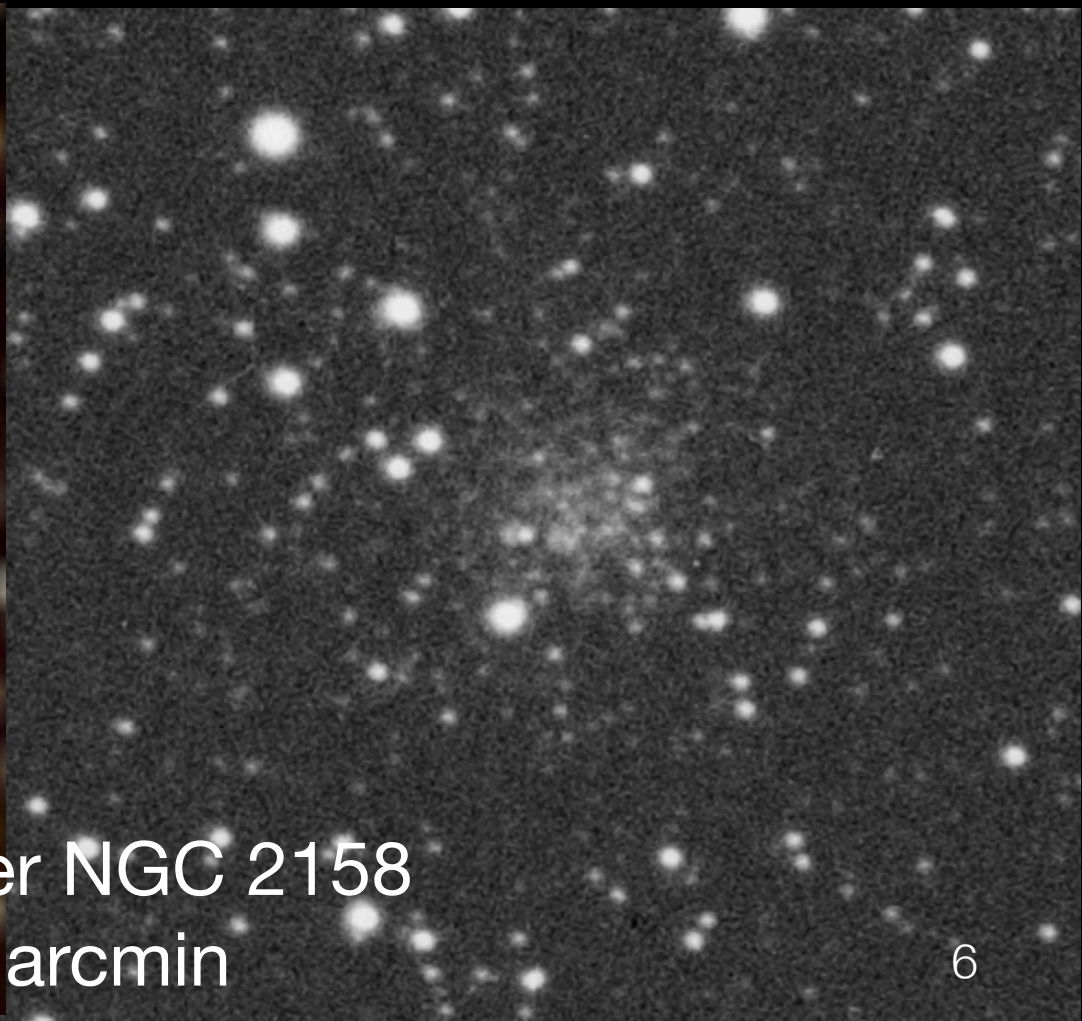
the Georgia Institute of Technology has made the 1927 paper version of the Barnard-Calvert *Atlas* accessible on-line

https://exhibit-archive.library.gatech.edu/barnard/

paper version (.pdf)

digitization (.fits)





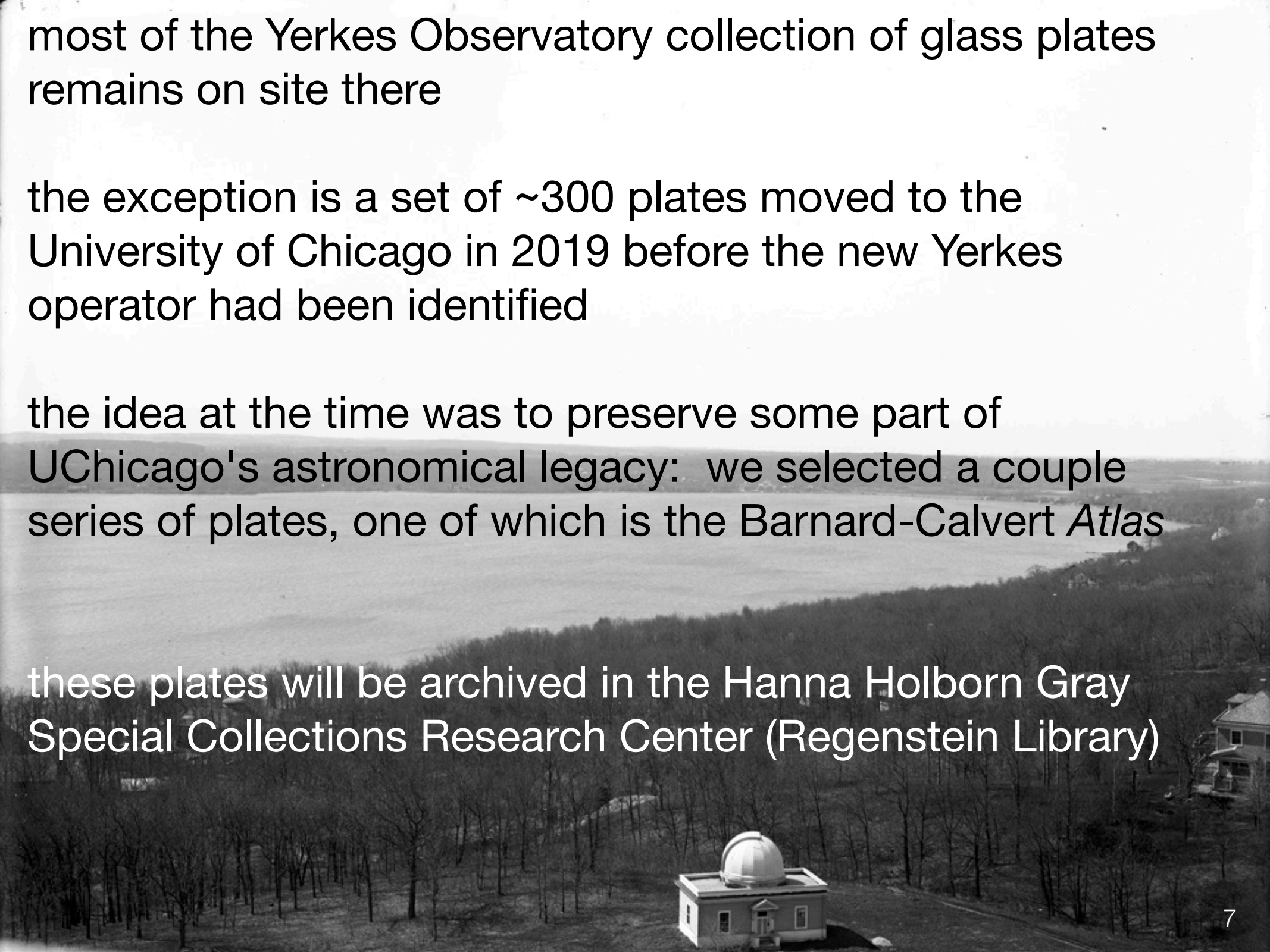
star cluster NGC 2158
FOV = 16 arcmin

most of the Yerkes Observatory collection of glass plates remains on site there

the exception is a set of ~300 plates moved to the University of Chicago in 2019 before the new Yerkes operator had been identified

the idea at the time was to preserve some part of UChicago's astronomical legacy: we selected a couple series of plates, one of which is the Barnard-Calvert *Atlas*

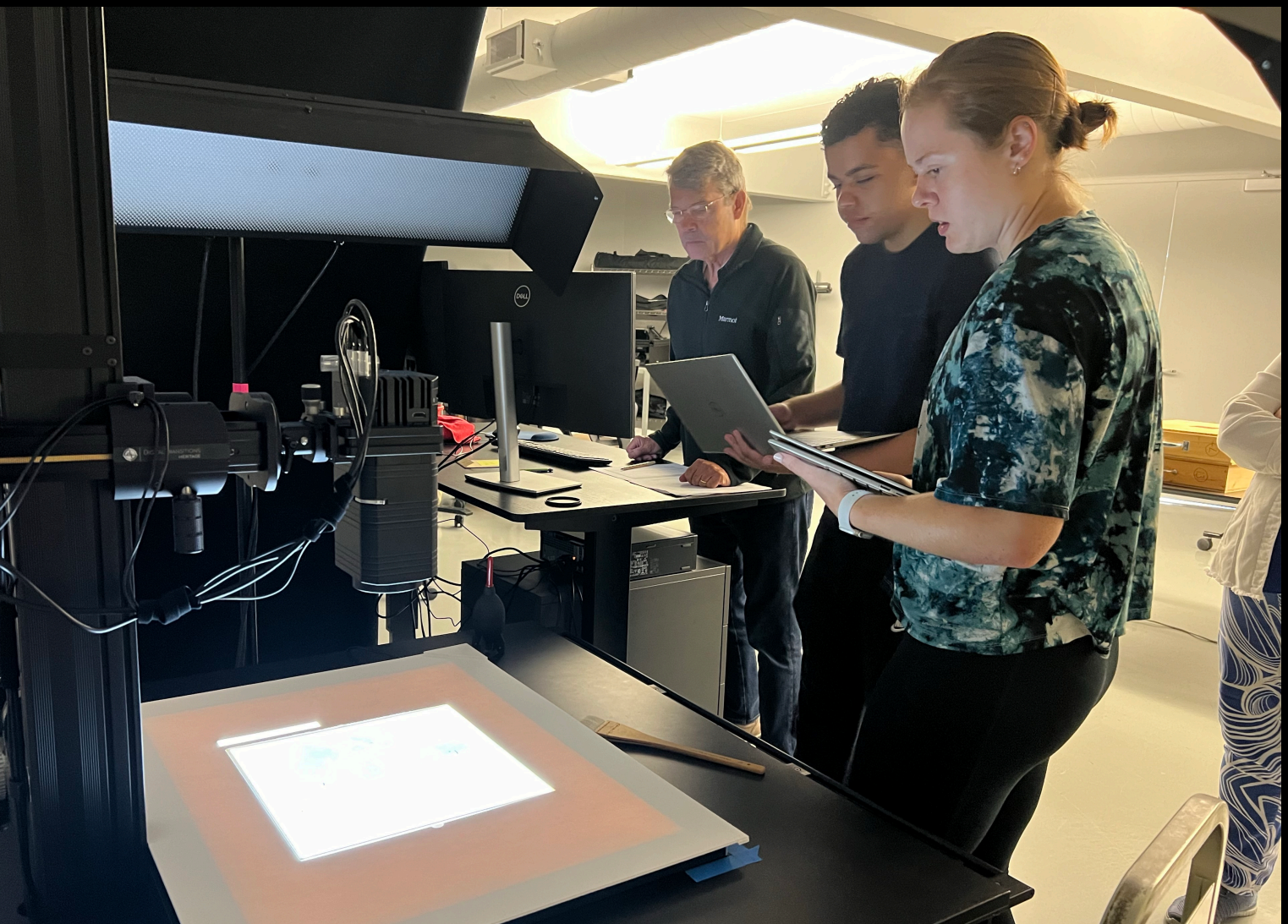
these plates will be archived in the Hanna Holborn Gray Special Collections Research Center (Regenstein Library)



We saw the idea of investigating what to do with the plates as a research opportunity for undergraduate students.

Student engagement has been a key part of the project since the beginning.

UChicago student group has recently finished digitizing the 49 plates of the *Atlas* with a PhaseOne camera in cooperation with the Library's Preservation Department



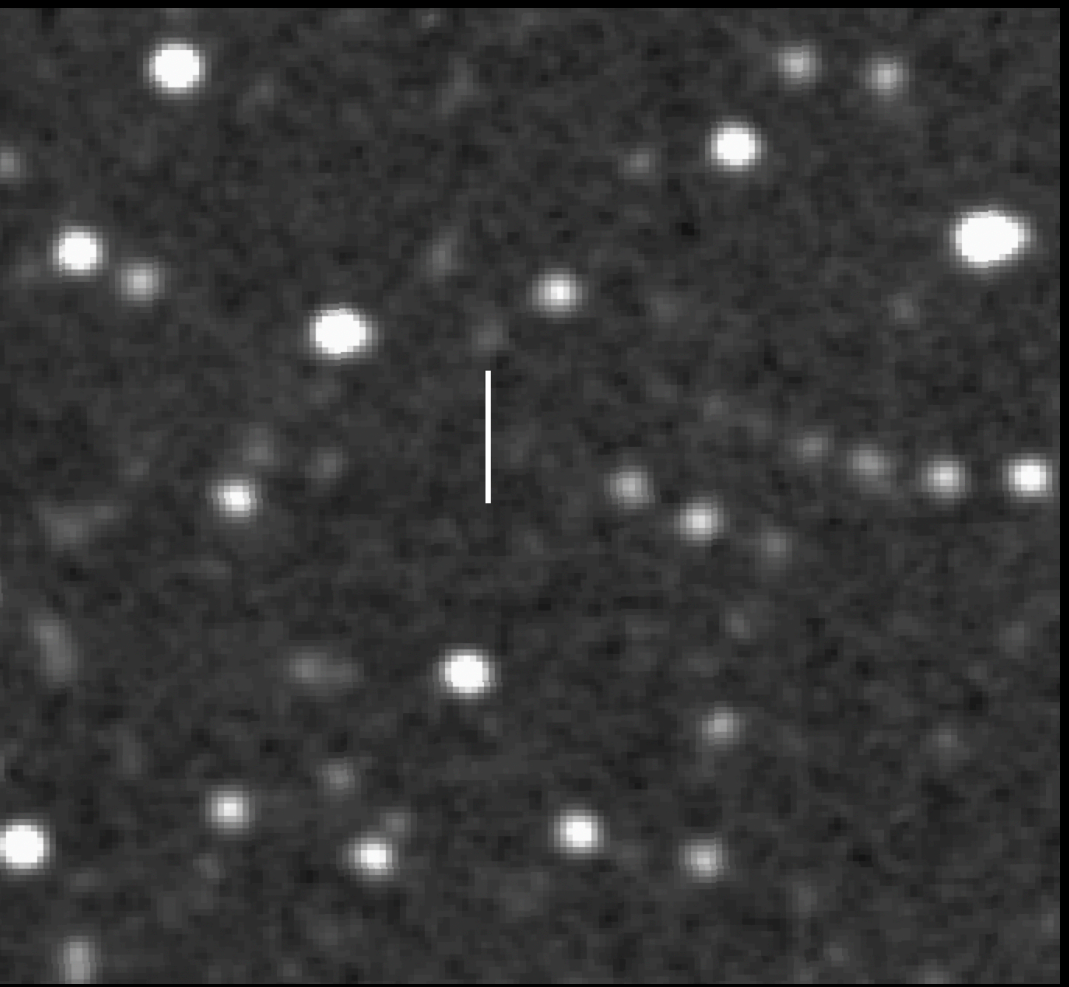
Devin Snow
Molly Laumakis

a mask restricts area to the central 18 × 13 cm (8 × 6 deg)

pixel = 2 arcsec

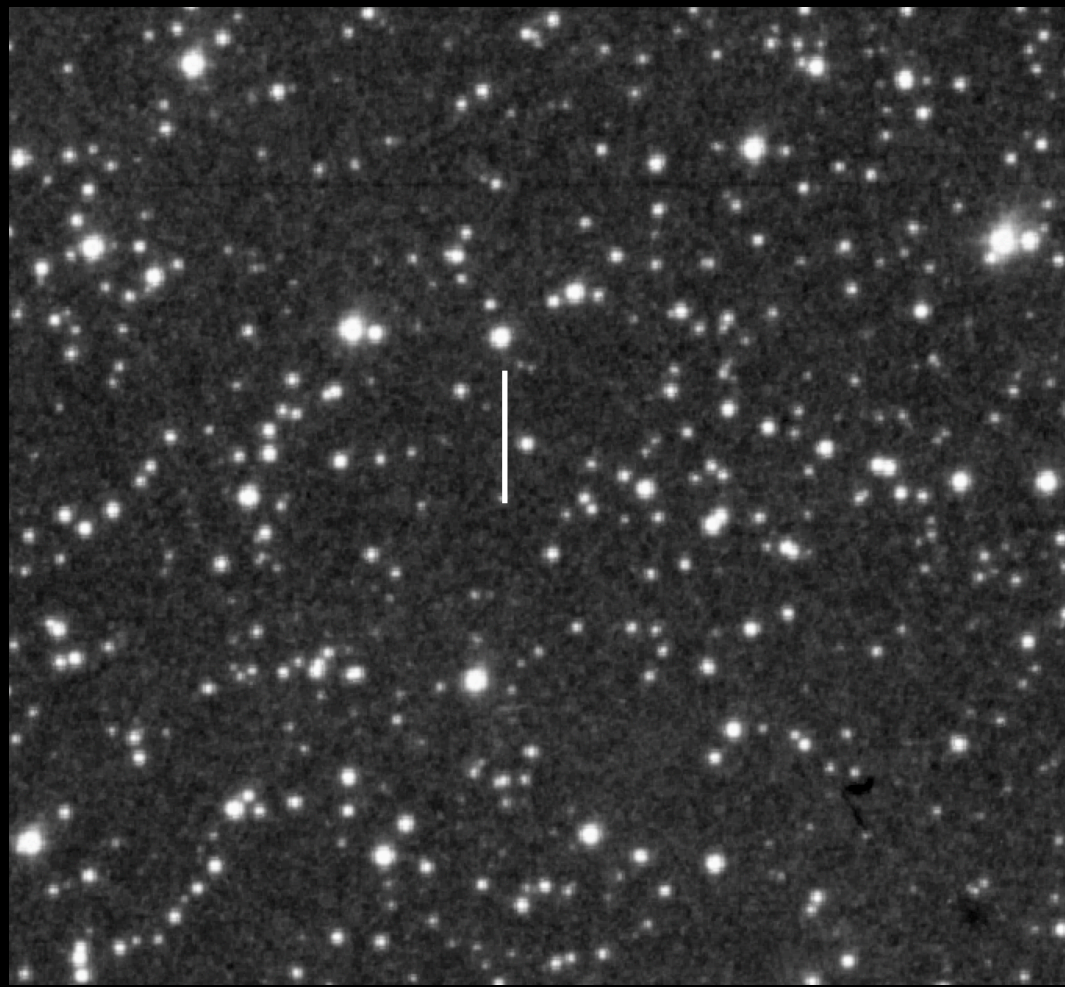
eclipsing binary star *BH Geminorum*

1905

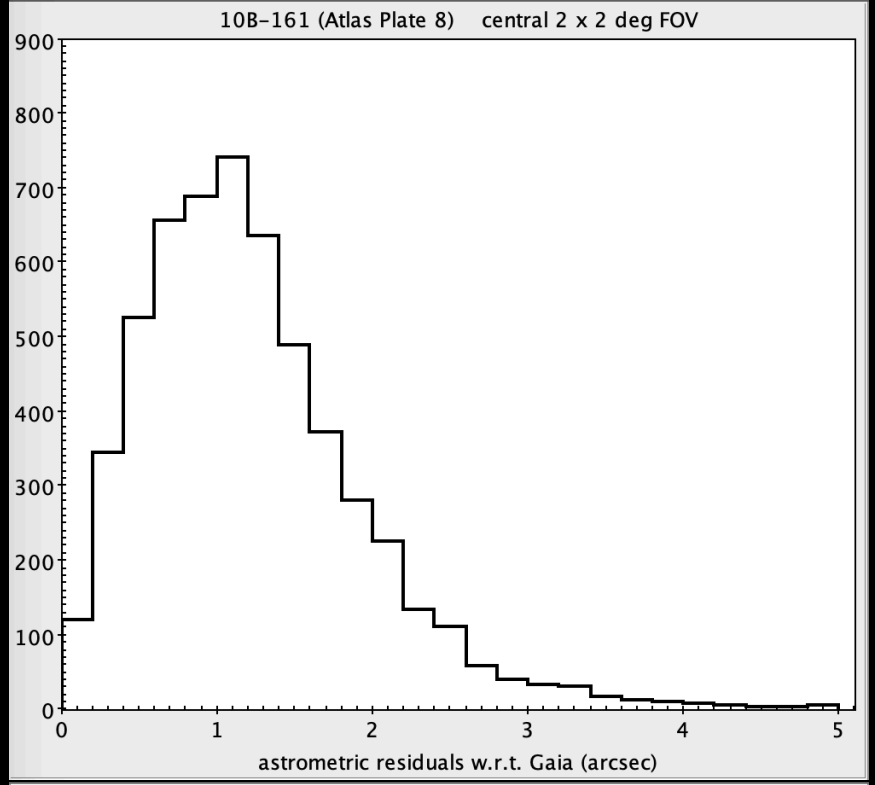


digitized plate from the
Barnard-Calvert *Atlas*

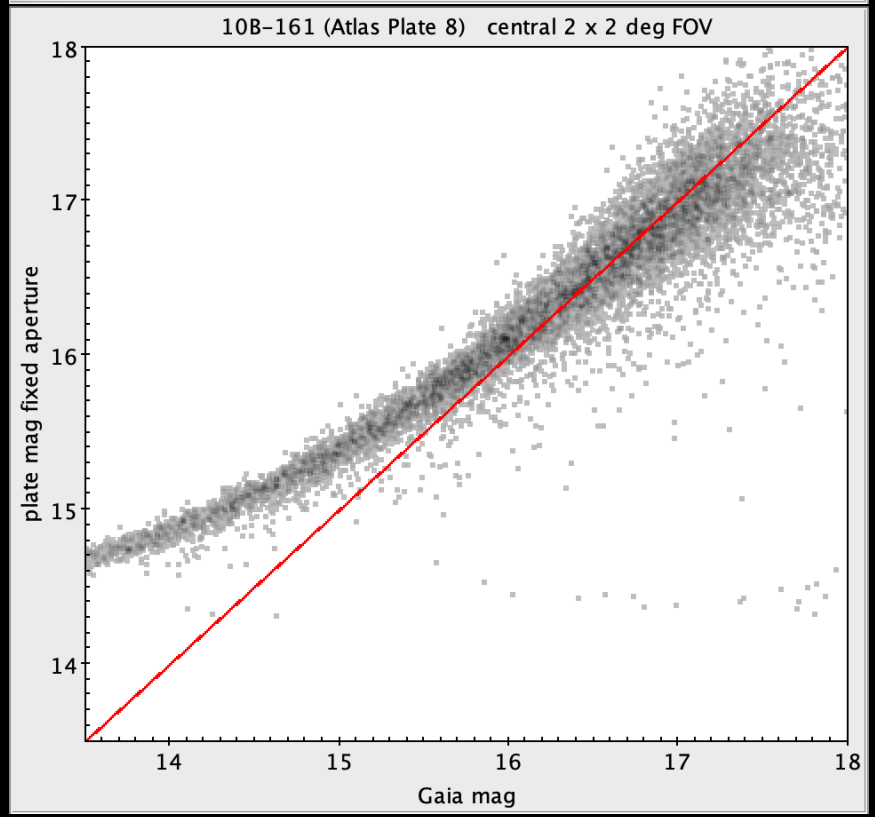
1955



Palomar Sky Survey B



example astrometric performance for one of the plates: precision is sub-pixel, good enough for identification of a star in *Gaia* DR3



example photometric performance: completeness falls off for mag > 17, rms ~ 0.1 mag at mag ~ 16, non-linear response at brighter magnitudes (due to plate, not to digitization)

Once we have finished our review of the digitizations, we will make the files available via the *Online Cultural and Historical Research Environment* (OCHRE)

https://ochre.uchicago.edu

many thanks to:

- AHO and the organizers of this meeting
- Yerkes Observatory
- Wayne Osborn
- Special Collections Research Center
- UChicago Library Preservation Department
- OCHRE