A 360mm f/19 Kutter Schiefspiegler

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AUSTRALIA
Arafura Sea
135°E
150°E
Timor Sea
Bathurst
Wessel
Prince of Wales
Cape York
Darwin
Kakadu
Arnhem Land
Cape York Peninsula
Great Barrier Reef
Coral Sea
Gulf of Carpentaria
INDIAN OCEAN
15°S
Collier Bay
Kimberley Plateau
Lake Argyle
Barkly Tableland
Mitchell
Gilbert
Cairns
Lake Woods
Tanami Desert
Lake Gregory
Townsville
Great Dividing Range
Barrow
Great Sandy Desert
Lake Mackay
NORTHERN TERRITORY
QUEENSLAND
Lake Disappointment
Alice Springs
Tropic of Capricorn
Lake MacLeod
Macdonnell Ranges
Gibson Desert
WESTERN AUSTRALIA
Lake Carnegie
Simpson Desert
Diamantina
Fraser Island
Barrow Range
Murchison
Grey Range
Brisbane
SOUTH AUSTRALIA
Lake Eyre (North)
Great Victoria Desert
Lake Austin
Rason Lake
Lake Blanche
Lake Eyre (South)
Lake Barlee
Nullarbor Plain
Lake Frome
Darling
30°S
Lake Gairdner
NEW SOUTH WALES
Perth
Mungo National Park
Great Australian Bight
Lachlan
Sydney
Adelaide
Murray
Sydney Opera House
Mt. Kosciuszko 2229 m
CANBERRA
Kangaroo Island
VICTORIA
Melbourne
Tasman Sea
King
Bass Strait
Furneaux
Mt. Ossa 1617 m
PACIFIC OCEAN
TASMANIA
Hobart
120°E
LEGEND
State Boundary
Major Road
Rail
River
Major City
Sea Port
Country Capital
Airport
Point of Interest
Salt Lake
Mt. Peak
Australian Overseas Territories
Norfolk Island
Christmas Islands
Heard and McDonald Islands
Ashmore and Cartier Islands
Cocos (Keeling) Islands
Coral Sea Islands Territory
Australian Antarctic Territory
Map not to Scale
0 300 600 Km
0 150 300 Miles
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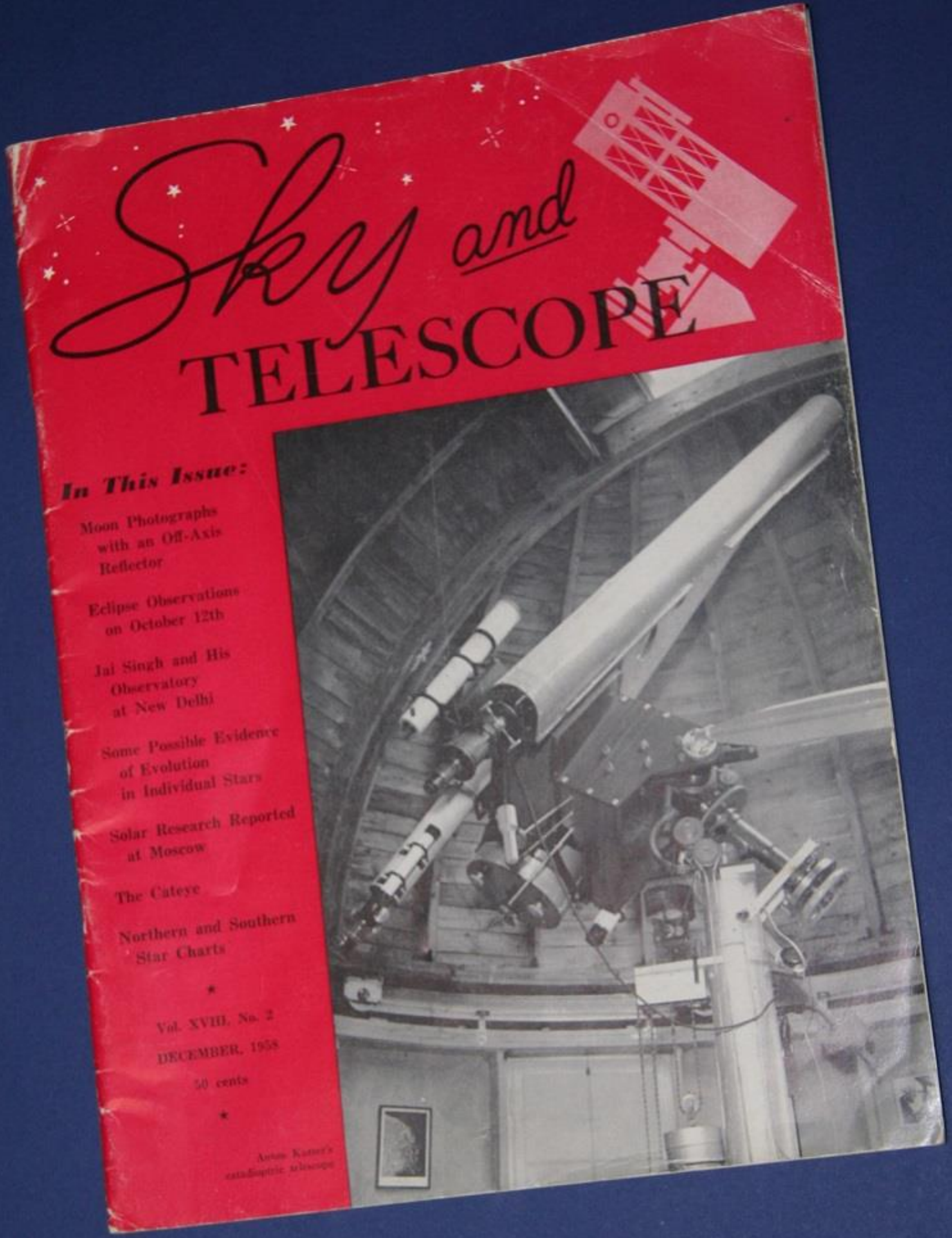
(Updated on 17th May, 2013)

Population 4.9 million

18 Myddleton Drive
Heidelberg

145.1^0 East
37.8^0 south


Sky and TELESCOPE
In This Issue:
Moon Photographs with an Off-Axis Reflector
Eclipse Observations on October 12th
Jai Singh and His Observatory at New Delhi
Some Possible Evidence of Evolution in Individual Stars
Solar Research Reported at Moscow
The Cateye
Northern and Southern Star Charts
Vol. XVIII, No. 2
DECEMBER, 1958
50 cents

grinding the wetted primary was checked by the Foucault test. It is important to hold the radius of curvature to 1-inch tolerance if the indicated dimensions are to be used. Remember, too, that it is more difficult to achieve a good long-focus sphere than one of average focal length.

Polishing was done in the usual manner, except that another plate-glass disk was used for backing the pitch lap. Because of the very shallow curve required, this disk may be left flat if a good $\frac{1}{4}$ inch of pitch is poured on it. And after the primary was completed, the secondary, still $4\frac{1}{2}$ inches in diameter, was hot-pressed onto the same pitch lap, which quickly conformed to the shallow reverse curve.

During polishing, the convex surface was periodically tested through its flat back, using two thirds of the radius of curvature for the knife-edge position. . . . The surface could also have been checked by interference fringes if it were fitted against the concave primary.

The final biscuit cut was made through the secondary's finished surface, which was protected from grit by two layers of masking tape. Care was needed to assure alignment of this cut with the one coming from the back. But the secondary did not suffer from the carborundum used in cutting, nor did it have a turned-down edge. It would have been difficult to achieve this result if the mirror had been ground after cutting it to size.

For the mounting, a full-sized layout should be scaled up from the drawing. The mahogany cradle (see Fig. 84) was made at a mill; I bored out the 3-inch hole in the lathe and made the $\frac{1}{8}$-inch saw cut later. The $\frac{3}{8}$-inch side pieces were left somewhat larger and were cut only after checking with the full-sized layout. A large piece of sandpaper was stretched over the curve of the primary tube, and the side pieces were lapped to it after being screwed to the cradle. Six little wood screws inside the tube secure it to the side pieces. The distance Δ' between the center of the primary mirror and the optical axis of the secondary's reflection must be precisely 8 inches. This is built into the mount, so it is very important to preserve it by fitting the side pieces and the tube together carefully.

After it is tilted into position, the secondary must be concentric with the 3-inch tube. I accomplished this by drilling the central hole in the back of the turned aluminum cell $\frac{1}{8}$-inch below center. The $\frac{1}{4}$-inch bolt that fits this hole is swivel-mounted in the cell to afford the play necessary for tilt adjustment. A compression spring holds the cell firmly against three pointed adjusting screws that fit into small cup-shaped recesses in the back of the cell. These screws are threaded into tapped holes in the backing plates. In both primary and secondary cells, one

FIG. 84. Oscar Knab's mahogany and jeweled-aluminum Schiefspiegler (oblique reflector) on its altazimuth mounting is particularly valuable for lunar and planetary observing because of its excellent image quality. It is less well suited for viewing dim extended objects, such as galaxies and nebulae, because its focal ratio is high.

of the adjusting screws must be in the mounting's meridional plane, as indicated by the *M* in the end view of the secondary cell (Fig. 83).

The curved cutout in the secondary tube was done with a wire-bladed hacksaw and then filed smooth. The slanted cutoff at the mirror end of this tube was made with the end plate of the cell fastened in place, facilitating cutting by stiffening the end. The tubes were blackened inside with two coats of blackboard slating and were machine-jeweled on the outside with steel wool wrapped around a rubber-capped wooden dowel in a drill press, and then lacquered. The mahogany received several coats of clear spar varnish.

For rough adjustment, place a tube with a $\frac{1}{8}$-inch eye hole into the eyepiece holder, and tilt the secondary by means of the three adjusting screws until the primary cell shows concentrically in the secondary mirror. This need never be repeated. To set the primary, tape a $4\frac{1}{2}$-inch cardboard disk just under the secondary tube at its outer end, to indicate the direction of the rays that will enter the primary. Direct the primary until it looks squarely at this disk, and rough adjusting is completed.

There are three devices to change the above mentioned fundamental system into a Schiefspiegler:
1) the anastigmatic, 2) the coma-free, 3) the catadioptrical device.

1) The anastigmatic device (former called 'The Neo-Brachy;')
(All symbols vide fig.2)
The inclination φ_1 of the incoming parallel beam of rays is determined by the condition for freedom of silhouetting. It must be the 'first ax-distance'

1) $$\Delta = y_1 + y_2$$

2) $$\sin 2\varphi_1 = \frac{\Delta}{e}$$

If this excentrical system is to be free from astigmatism the inclination φ_2 of the secondary must become

3) $$\sin \varphi_2 = \sin \varphi_1 \cdot \frac{y_1}{y_2} \sqrt{\frac{r_1}{r_2}}$$

When r_1 equals r_2 the formula 3) is simplified to

3a) $$\sin \varphi_2 = \sin \varphi_1 \cdot \frac{y_1}{y_2}$$

With φ_2 the 'second ax-distance' Δ' (important for the construction of the Schiefspiegler) is determined

4) $$\Delta' = e \cdot \sin 2\varphi_2$$

The inclination φ_2 of the secondary eliminates the astigmatism of the oblique beam of rays coming from the primary, but isn't sufficient to abolish thoroughly its coma too. It remains therefore a residual coma

5) $$\beta = 3 \cdot y_1^2 \left[\sin \varphi_1 \cdot \left(\frac{1}{r_1}\right)^2 + \left(\frac{y_2}{y_1}\right)^3 \cdot \sin \varphi_2 \cdot \left(\frac{1}{p} + \frac{1}{r_2}\right) \cdot \frac{1}{r_2} \right]$$

Note: Calculation with the slide rule will do. r_2 is to be introduced with negative sign. The value of β results in the arcus of the angle. To get the angle β in seconds of arc multiply the result with the factor 206265. The accuracy of the result is very high and reaches that of a logaritmic-trigonometrical computation (7 places) within ± 1 - 2 %. (Note 206265 = 180/π × 60 × 60), arcus = radian

For the above mentioned fundamental system the residual coma results of about + 4.″8 (undercorrected). This value changes only slowly in moderate changing the dimensions A, b of our fundamental system, but diminishes and enlarges rapidly by diminishing or enlarging the aperture ratio of the primary.

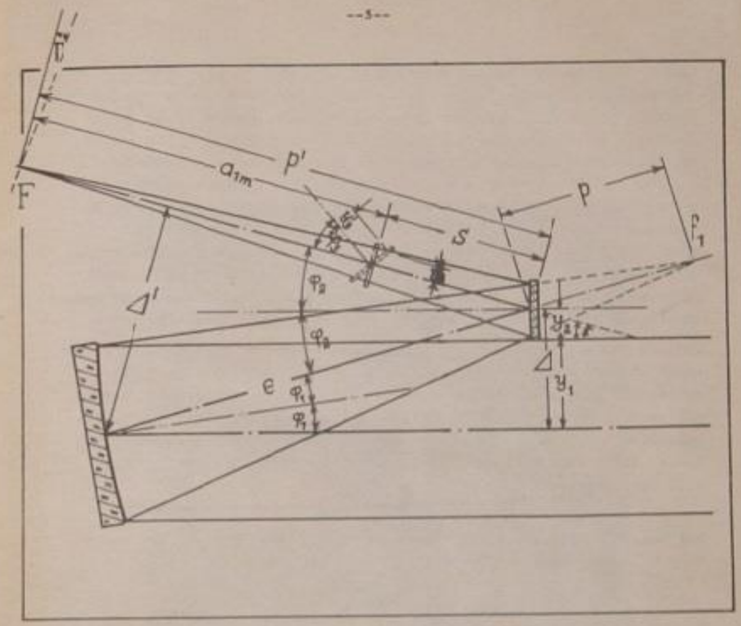


Fig.2 SCHEME OF THE SCHIEFSPIEGLER

Symbols

φ_1 inclination of the primary
φ_2 inclination of the secondary
φ_3 inclination of the corrector lens
Δ the first axis-distance
Δ' the second axis-distance
y_3 radius of the cone of light on the corrector-lens
y_3' radius of the corrector-lens
a_{1m} distance of the corrector lens from the meridional focus
s distance of the corrector lens from the secondary
δ variation-angle
Γ angle of the extended field of view toward the eyepiece's focal-plane.

All other symbols v. fig.1

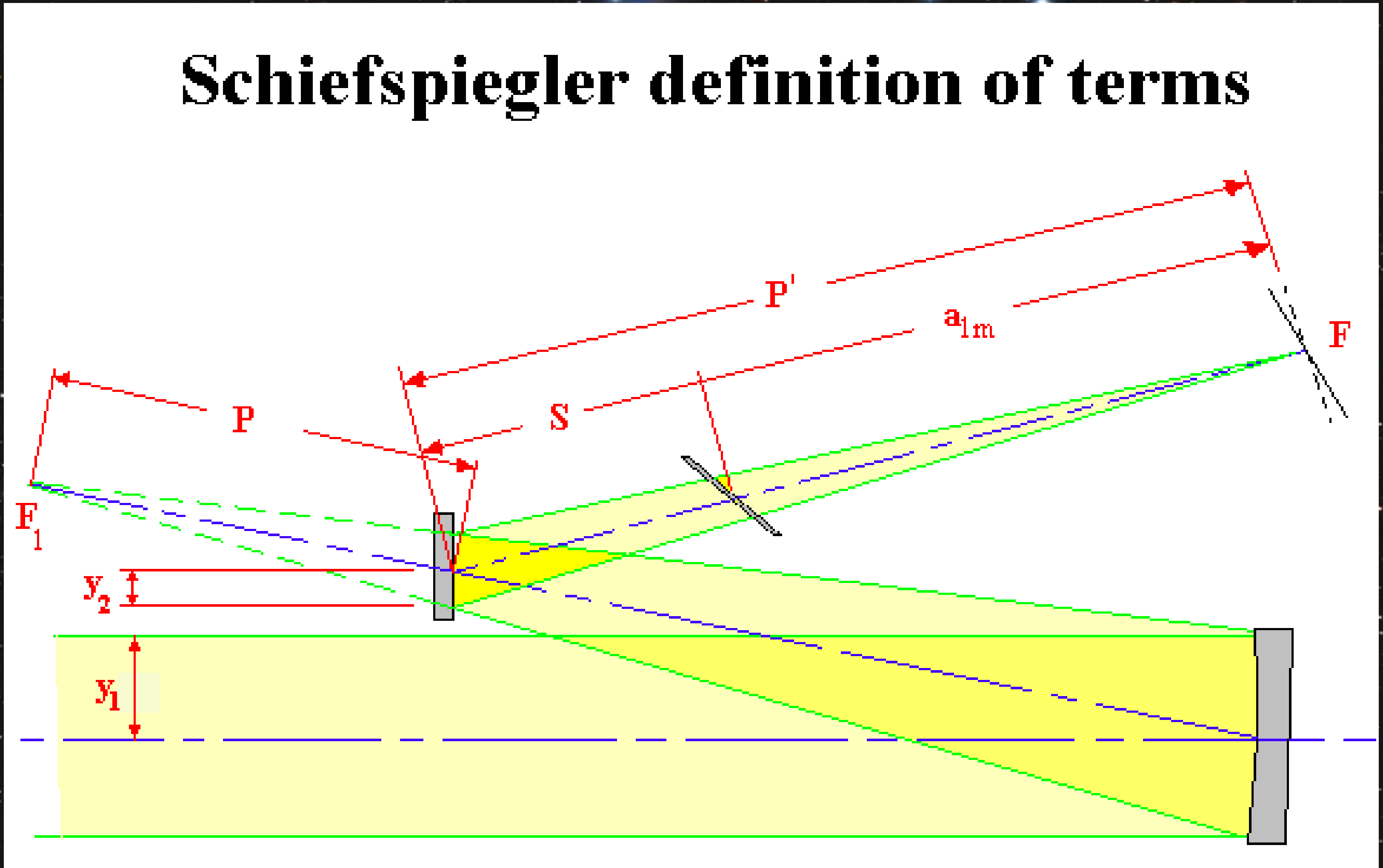
105mm f/25
Anastigmatic Schiefspiegler
1968


18


30
60
90


30
60
90

315mm Kutter Schiefspiegler 1969



The Observatory

3.35 metre (11 feet) diameter
Fibre glass dome.

5 minutes.
3" Strokes with ~~or~~ 2 lap
of pressure over edge
(ie on edge of mirror)

Changed to Rouge
Same as above.

Same as above.

9

4 Minutes.
Long strokes. (3"
pressure over edge for 2 laps.
Surface is getting uneven.
Polish with parabolizing X
strokes for 3 laps

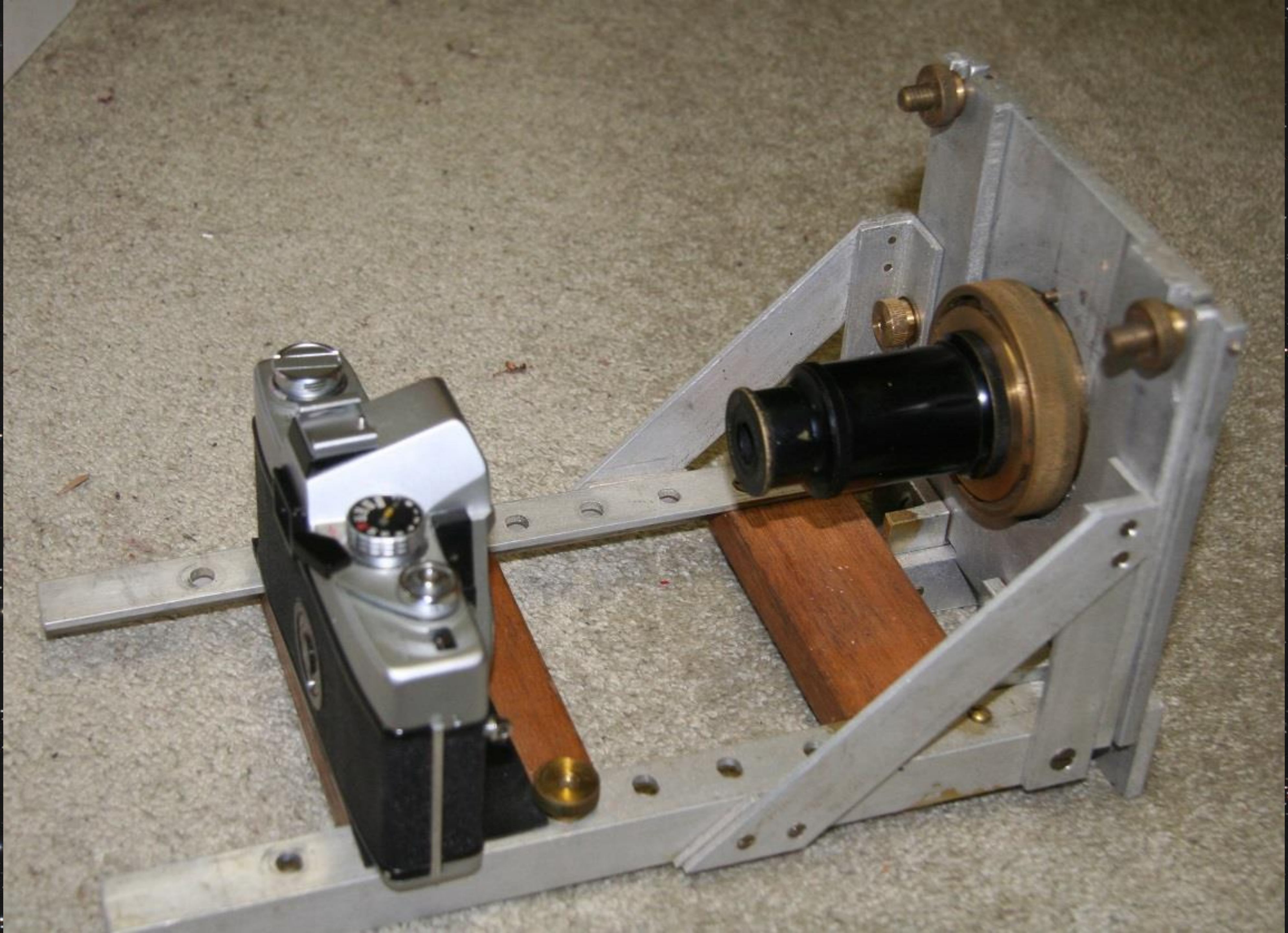
10 minutes
3" stroke
cerium oxide.
No change

Secondary Cell

Fibre glass

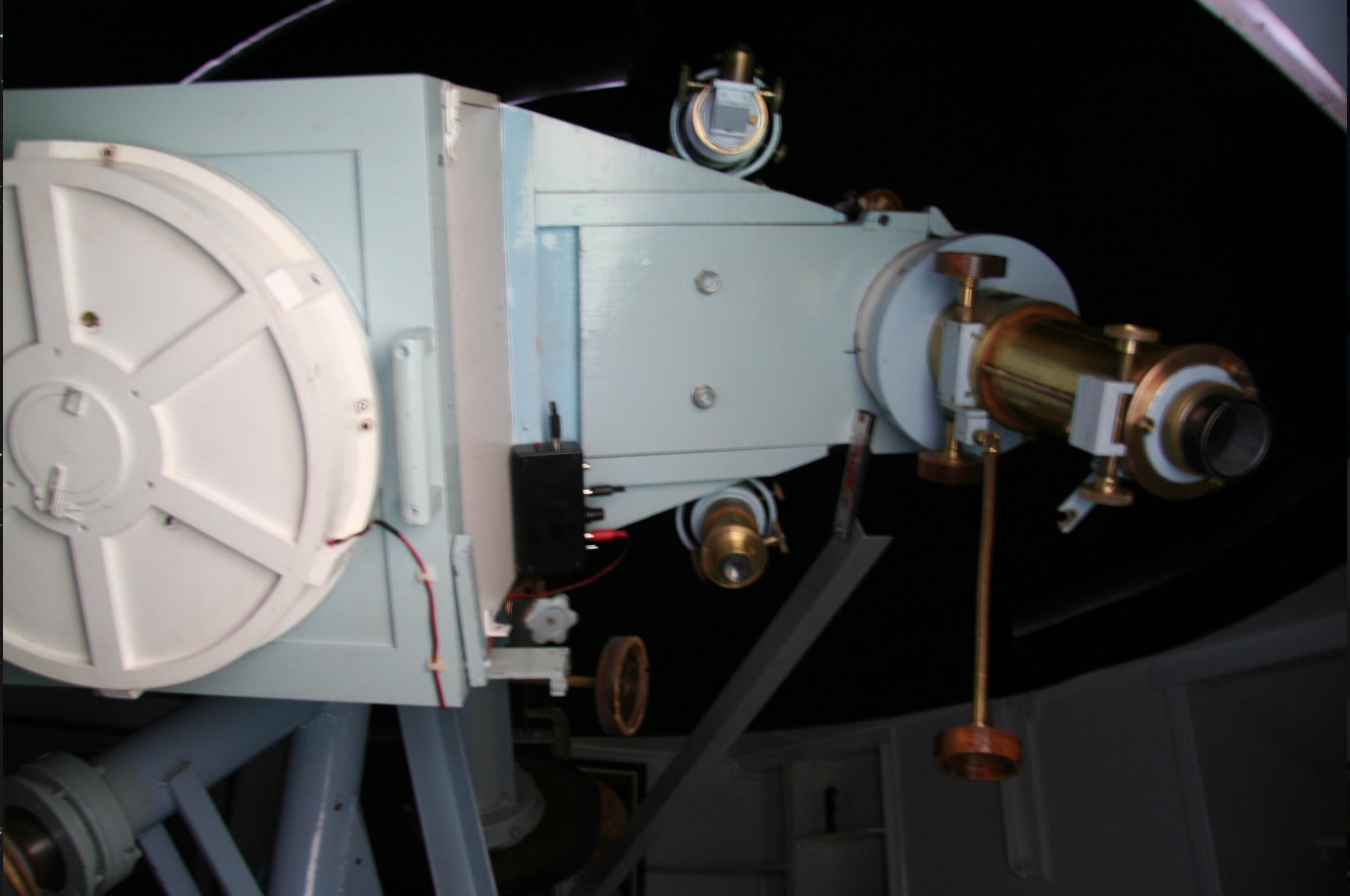
Lens Cell


Pacific
135/24
ILFORD HP4



The drive


THE HEAVENS



Primary **Material :- BVC**

R_1 = 8200 mm. Diameter D_1 = 360 mm.

Thickness (edge) =

F_1 = 4100 mm.
f/ratio = f/11.389

Secondary **Material:- Zerodur (see notes under optical work)**

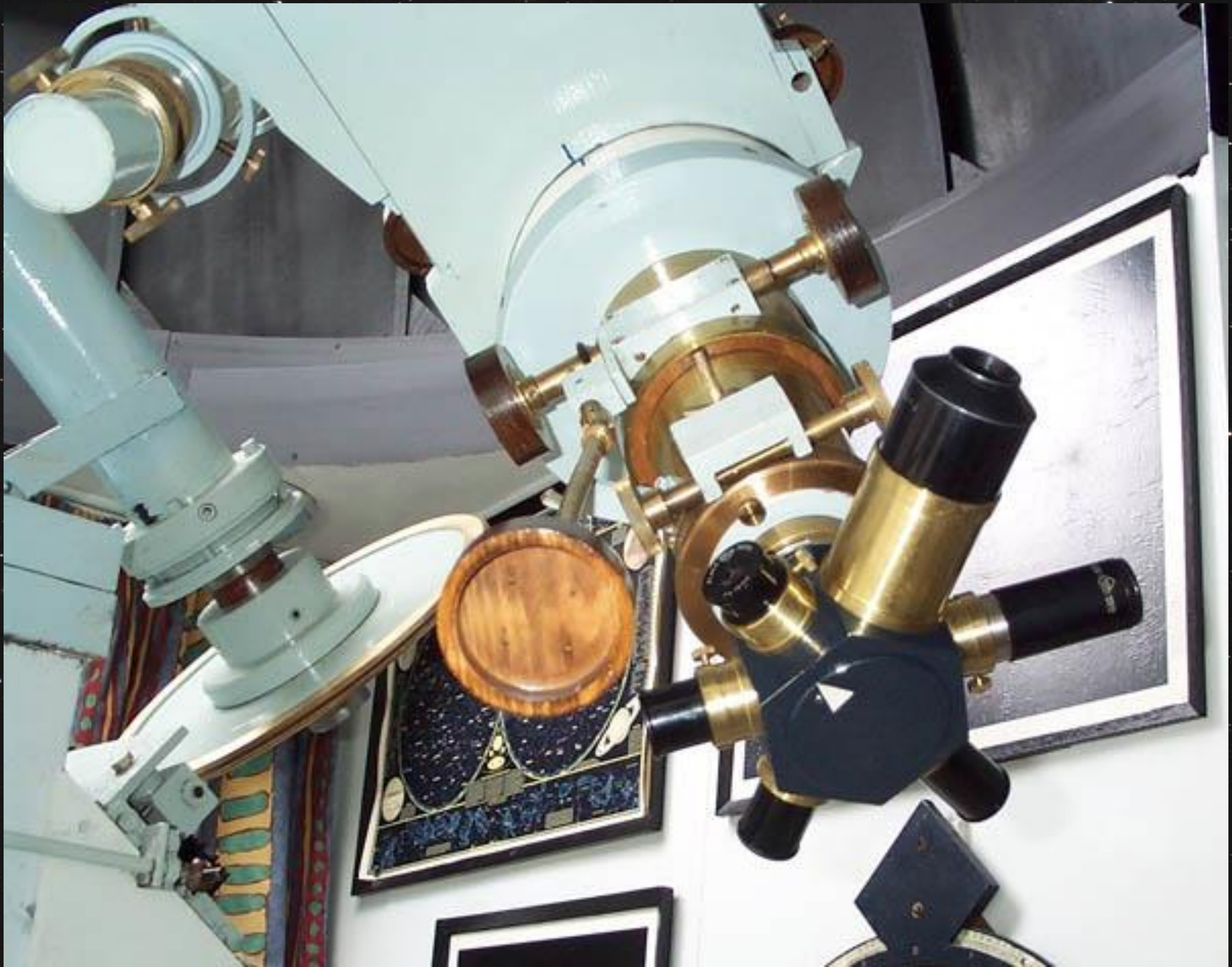
R_2 = 8300 mm.
Diameter D_2 = 155.28 mm.

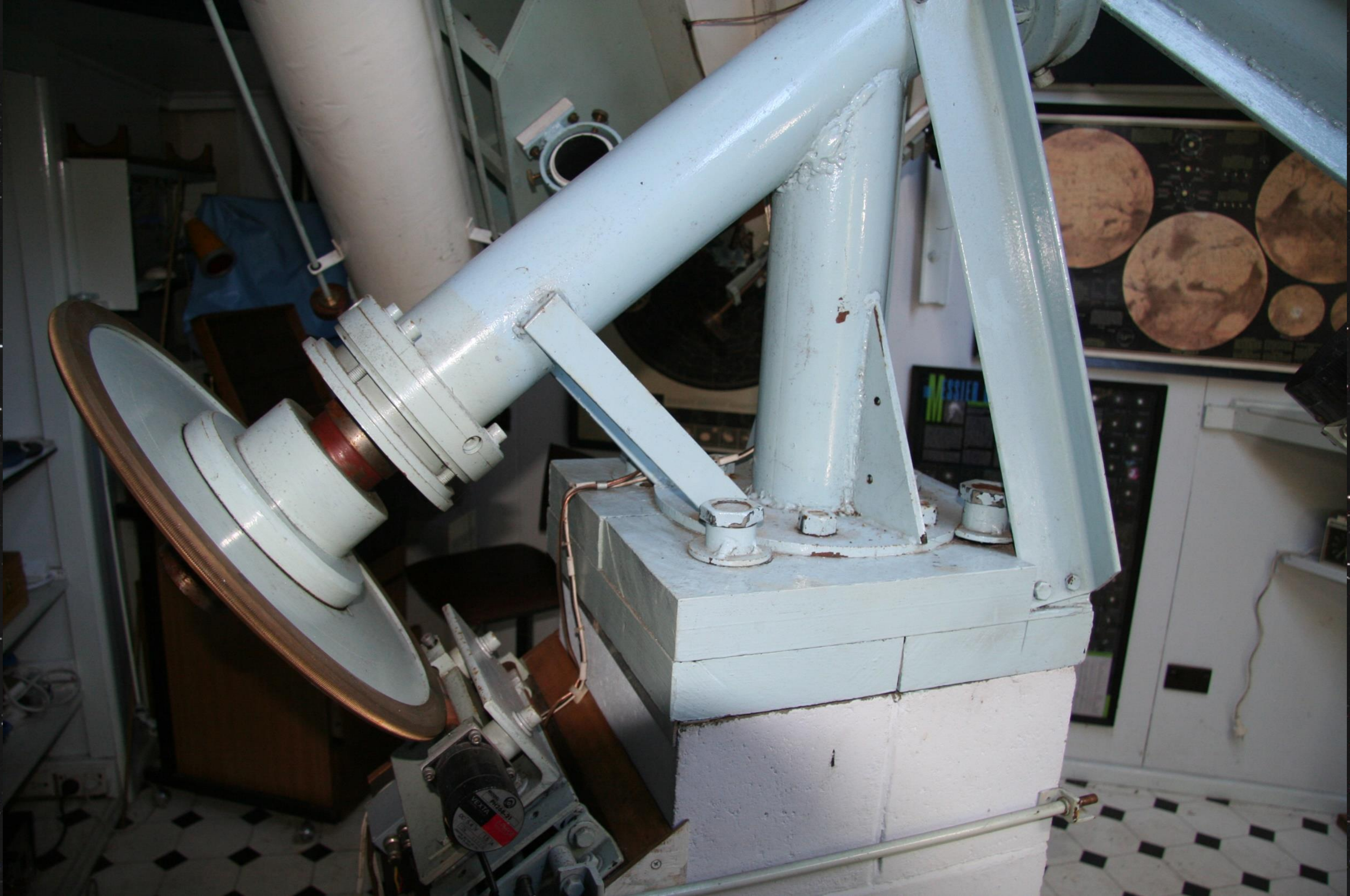
Thickness (edge) =

Tertiary (tilted lens) Material:- C2 512605

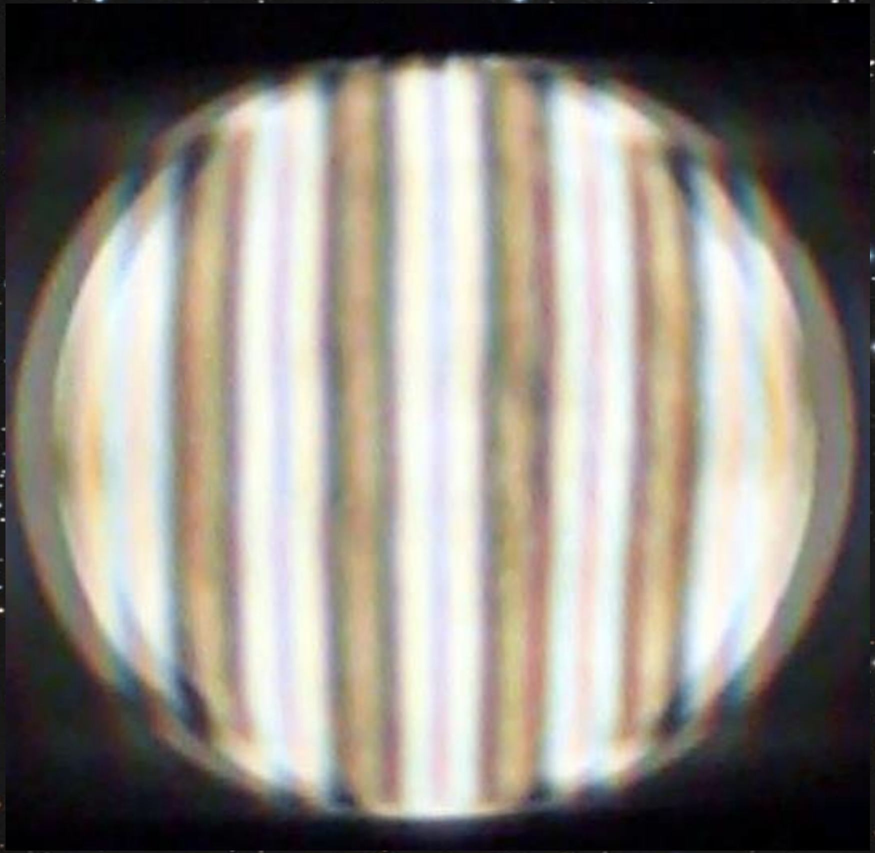
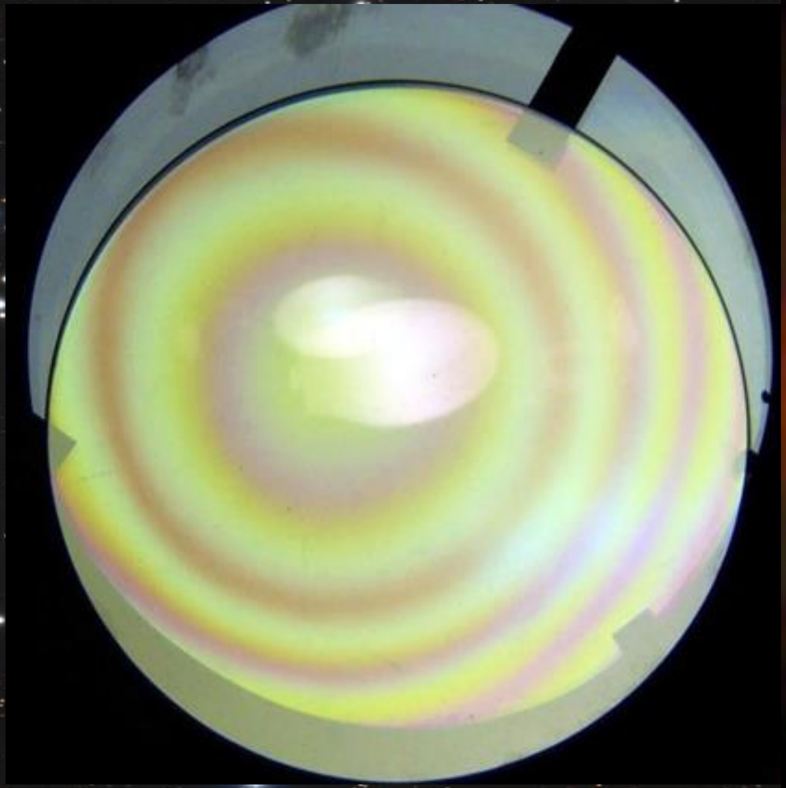
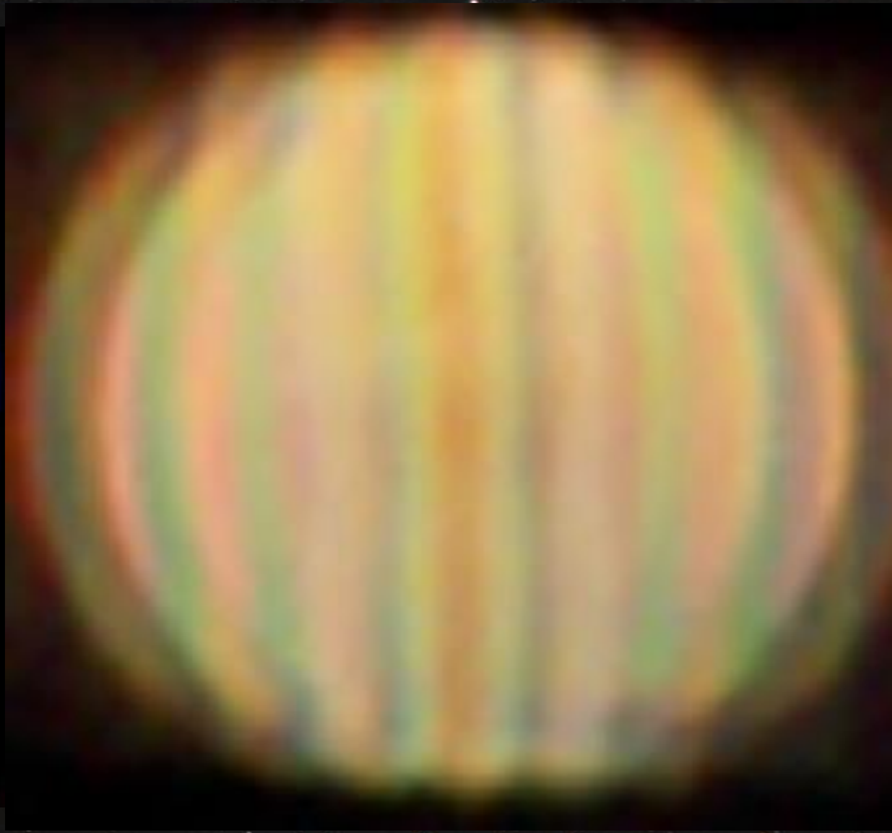
F_3 = 73000 mm.
Diameter D_3 = 130.08 mm.


Aluminium
Fan
30. 6. 2003

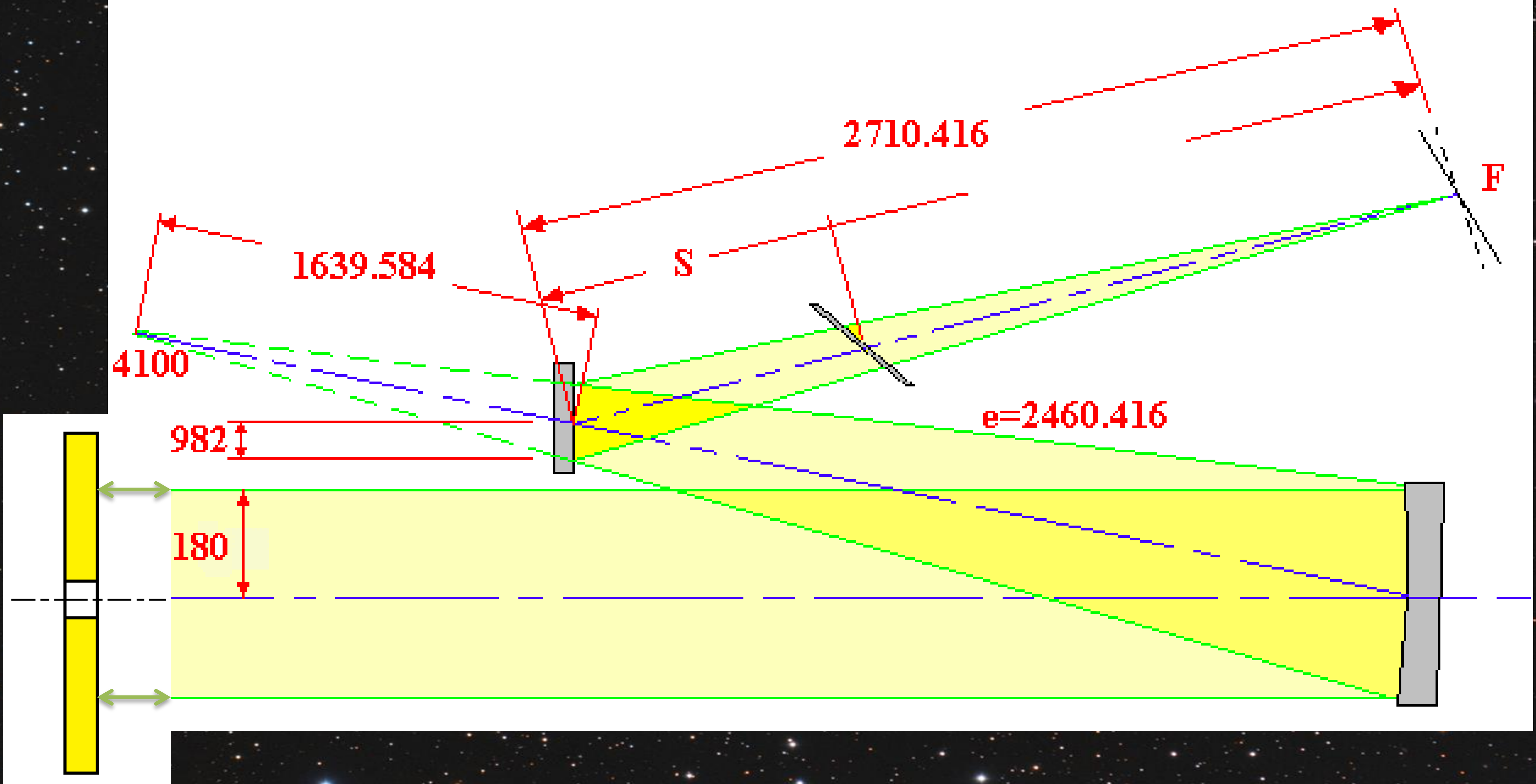


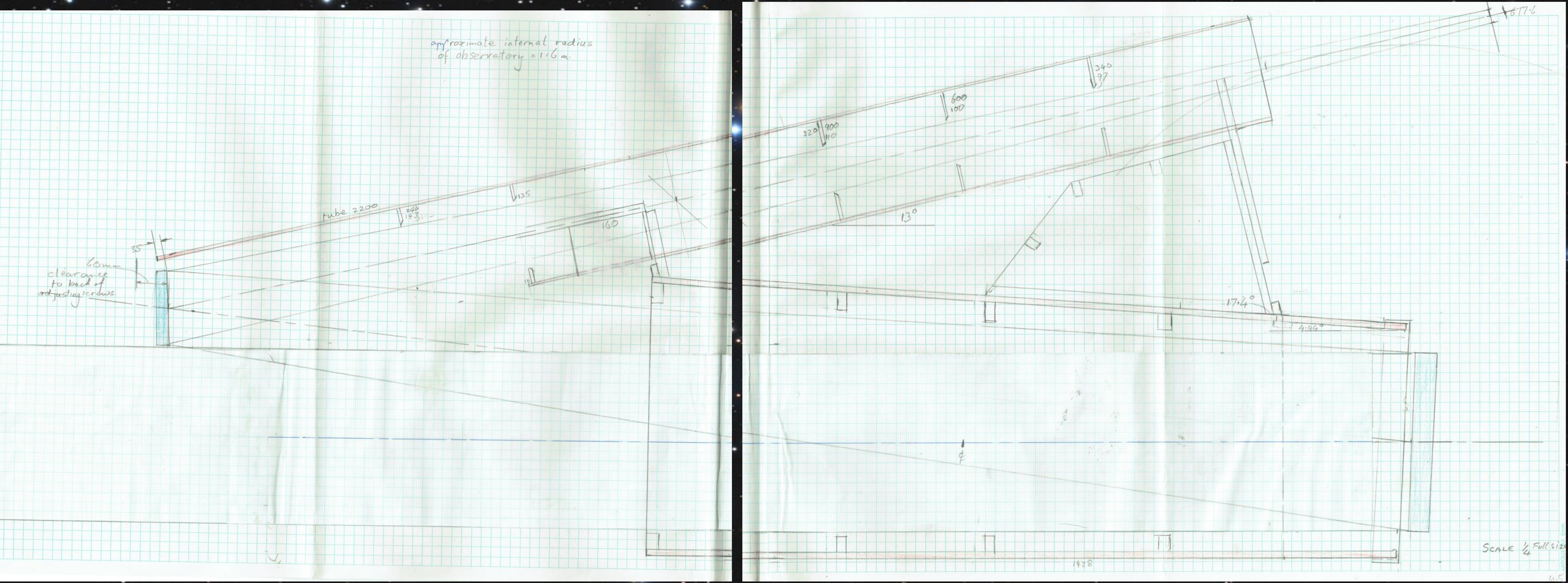



30. 6. 2003

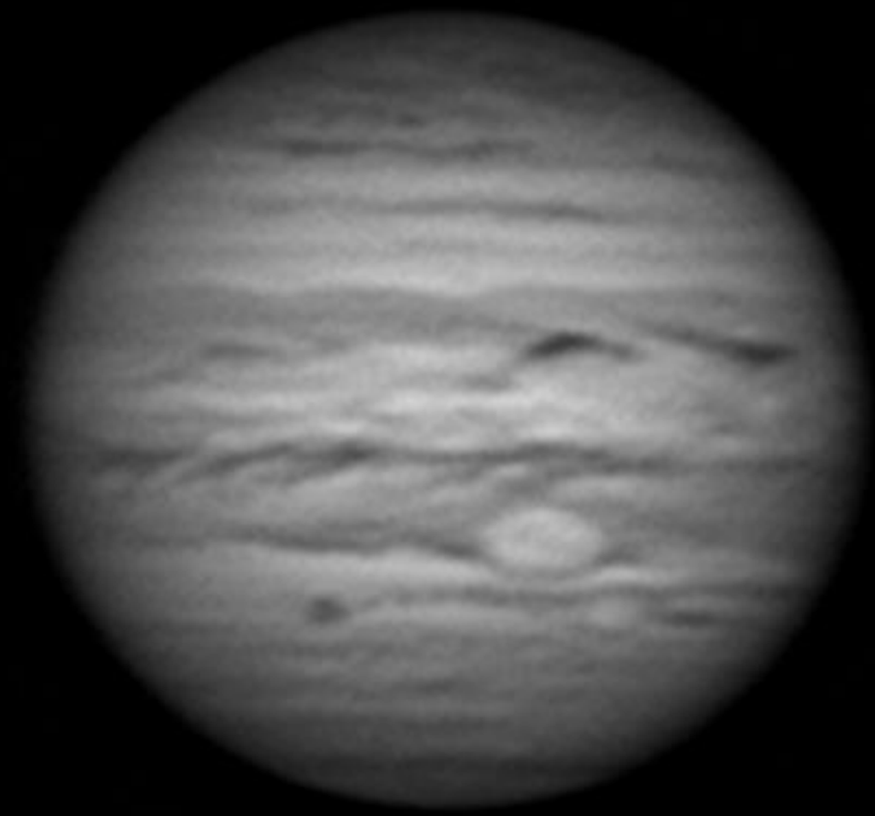
Summary





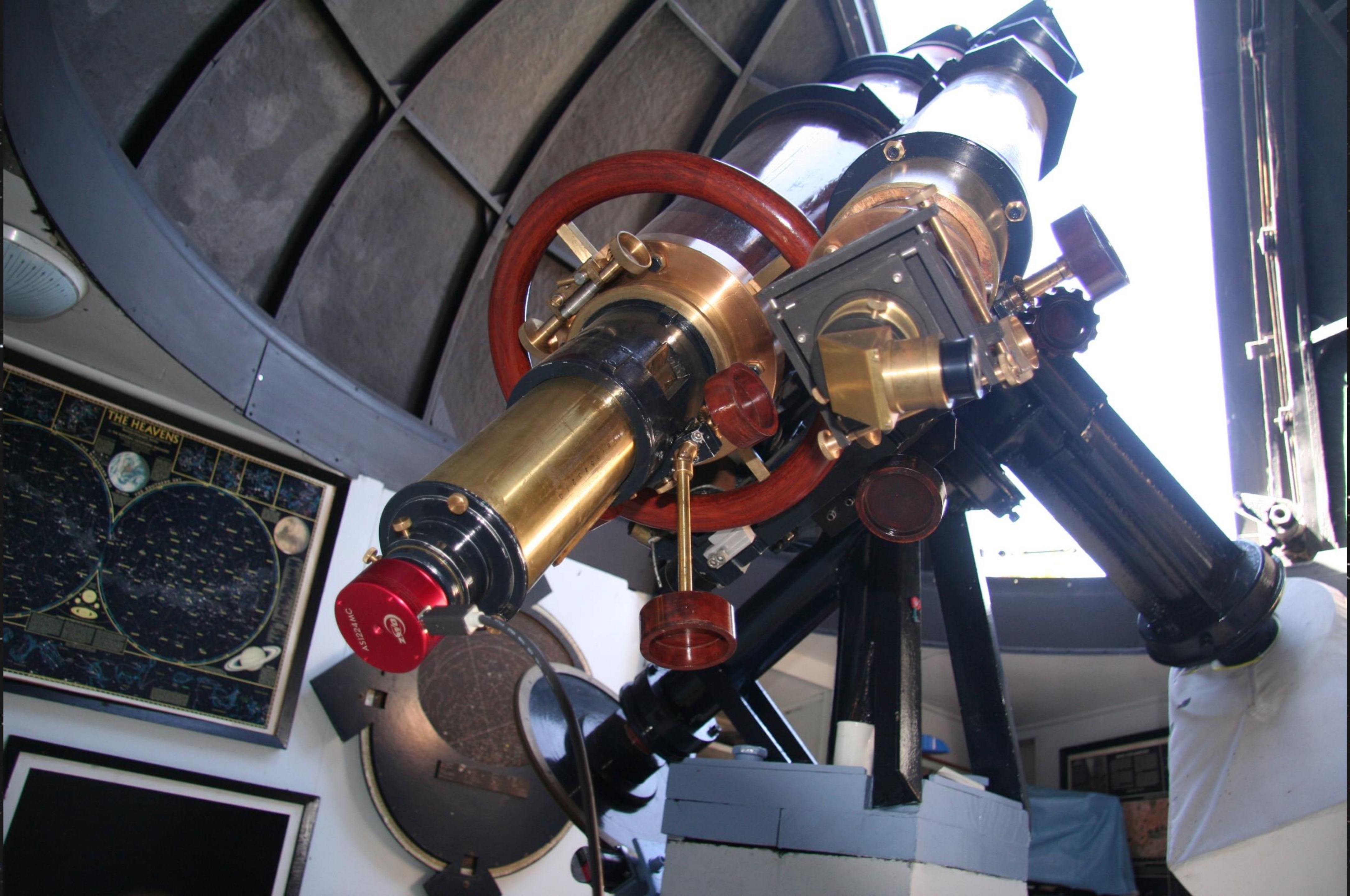
approximate internal radius
of observatory = 1.6 m.
tube 2200
35
60mm
clearance
to back of
adjusting screws.
160
13°
17.4°
4.44°
1428
SCALE 1/4 Full size

2008-07-23_09-47-25

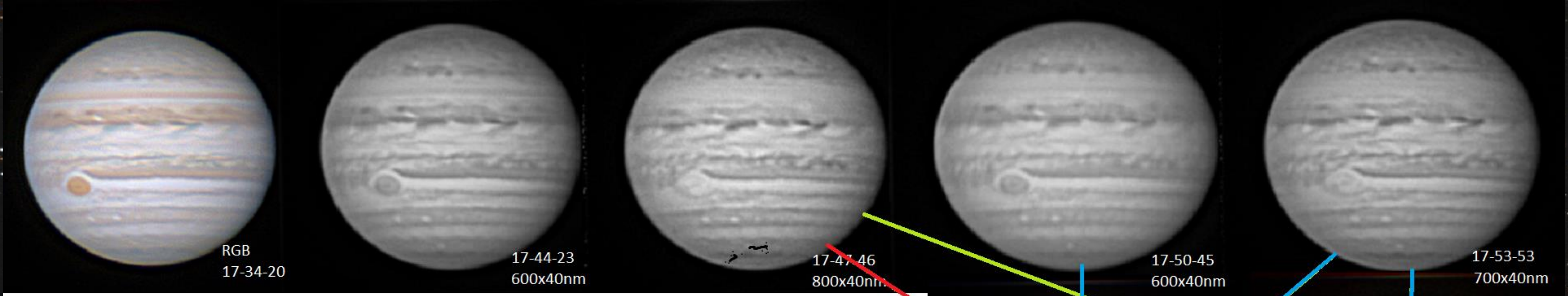


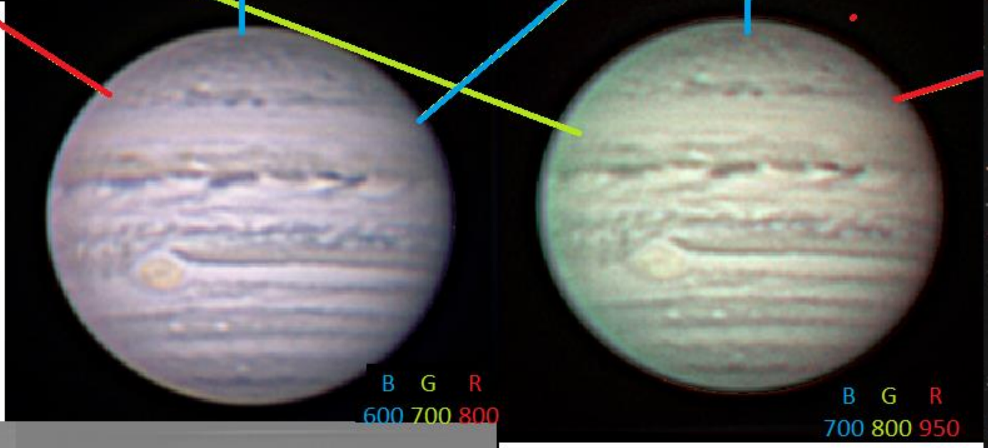

ZULU TIME
HYPERION
The Clementine Atlas of the Moon

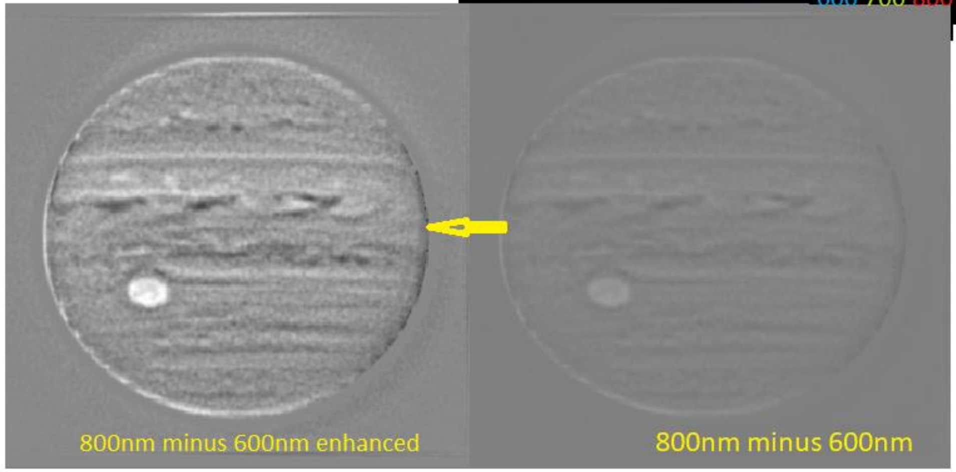
2



6 March 2018


RGB
17-34-20
17-44-23
600x40nm
17-47-46
800x40nm
17-50-45
600x40nm
17-53-53
700x40nm


B G R
600 700 800
B G R
700 800 950


800nm minus 600nm enhanced
800nm minus 600nm


Questions ??