

FEB 29 OBS.

14:10 They're done

setting up on SAO 140935 (dimmer) so I can use exp. of 5 sec.

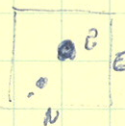
1 SAO 140935 centering, focus, etc  
 1'40s read out Yippee.  
 centering OK (977, 1015)  
 FWHM 3.5

2 focus frame (using field stars)

|       |      |      | FWHM | FWHM | FWHM |
|-------|------|------|------|------|------|
| 14:33 | 4835 | 0    | 5.32 |      | 6.58 |
| 14:33 | 4830 | -20  | 4.44 | 4.64 | 5.02 |
| 14:34 | 4825 | -40  | 3.58 | 4.10 | 4.13 |
| 14:34 | 4820 | -60  | 4.26 | 4.67 | 4.38 |
| 14:35 | 4815 | -80  | 3.28 | 3.37 | 3.35 |
| 14:35 | 4810 | -100 | 3.77 | 3.65 | 3.85 |
| 14:36 | 4805 | -140 | 3.78 | 3.70 | 3.69 |

Setting focus to 4815

expect



3 Pluto pos'n + exposure

bright star saturated (barely)  
 next brightest - 9394 - 1540  
 pluto @ 4832 - 1550

exp = 15

Bright star is only point near saturation.  
 no real problems w/ mosaicing.

4 Mosaic - using Dave W's mosaic control

~~14:58~~

36 →  
 0 → 1

0

15:00

1

1

15:01:23

2

3

Telescope did not offset

Dave's mosaic not working -

Also - displayed frame is messed up, partial file written.

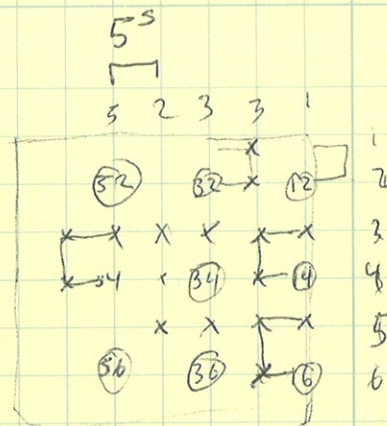


Feb 24 obs...

5 old-fashioned mosaic

|          |          |
|----------|----------|
| 15 06 12 | -0.5 0   |
| 15 07 14 | -75.3 0  |
| 15 08 03 | -75.3 75 |
| 15 08 50 | -0.5 75  |

1'15" = 75" [



Check viability of mosaic

I think it's ok.

|   |          |     |    |
|---|----------|-----|----|
| 6 | 15 17 30 | 0   | 0  |
|   | 15 19 03 | -75 | 0  |
|   | 15 19 59 | -75 | 75 |
|   | 15 22 09 | 0   | 75 |

2 photos off -  
what we want:  
telescope N

|     |          |      |    |
|-----|----------|------|----|
| 7   | 15 28 00 | 0    | 0  |
| 8   |          | 0    | 0  |
| 9 8 | 15 30 10 | 0    | 0  |
|     | 15 30 46 | 75.8 | 0  |
|     | 15 31 33 | 75.8 | 75 |
|     | 15 32 19 | 0    | 75 |

stone

stone

photo 12

photo 14

FWHM 4.08

photo 14

|      |          |   |   |
|------|----------|---|---|
| 10 9 | 15 34 44 | 0 | 0 |
|------|----------|---|---|

photo 16

|       |          |    |    |
|-------|----------|----|----|
| 11 10 | 15 36 45 | 0  | 0  |
|       | 15 37 25 | 75 | 0  |
|       | 15 38 03 | 75 | 75 |
|       | 15 38 53 | 0  | 75 |

photo 16

|       |          |   |   |
|-------|----------|---|---|
| 12 11 | 15 40 53 | 0 | 0 |
|-------|----------|---|---|

photo 54

FWHM 4.00

|       |          |    |    |
|-------|----------|----|----|
| 13 12 | 15 43 08 | 0  | 0  |
|       | 15 43 54 | 75 | 0  |
|       | 15 44 36 | 75 | 75 |
|       | 15 45 28 | 0  | 75 |

photo 54

|       |          |   |   |
|-------|----------|---|---|
| 14 13 | 15 47 33 | 0 | 0 |
|-------|----------|---|---|

photo 52 FWHM

14 what is this? Did I ask for this?

Ph ha - this is not  
a "extra" frame.  
ignore this comment



Feb 24 obs.

15

photo 52

display comes up w/h. te.

sky coming up?

not much

no stars at

stretch of

16

15 50.26

same frame

photo 56

shutter stuck closed?

 $1567 \pm 4.7$  m active -s $1551 \pm 2.9$  m bias

17

16:00:15

same frame

photo 52

not the shutter,  
first frame.

Dave can hear it.

18 ~~18~~rotate filter wheel all the way around  
back to V~~19~~

|    |    |    |    |    |
|----|----|----|----|----|
| 16 | 03 | 54 | 0  | 0  |
| 16 | 04 | 33 | 75 | 0  |
| 16 | 05 | 18 | 75 | 75 |
| 16 | 05 | 02 | 0  | 75 |

photo 52

19 ~~20~~

16:09:23

0 0

photo 36

20 ~~21~~

16:11:25

photo 34

21 ~~22~~

16:13:31

photo 56

22 ~~23~~

16:15:28

photo 45

23 ~~24~~

16:17:04

photo 43

24 ~~25~~

16:19:20

photo 33

25 ~~26~~

16:22:01

photo 35

27

16:24:03

exp 55

photo 24



## Feb 24 analysis

TO DO

✓ftp

✓backup

✓rectify frame #'s in log and book; xerox log

✓files for tomorrow - objlist + mosaics

df

565 749

OK

27 files

Feb 25  $\alpha = 16\ 05\ 19.6 \sim 19.5$   $\delta = -6\ 55\ 37.1 \sim 37.5$ 

$$\begin{array}{r} 37.1 \\ + 37.5 \\ \hline 74.6 \end{array}$$

| $\delta$     |   | $\delta$ |
|--------------|---|----------|
| 1            | 1 | -6 52 30 |
| 2            | 2 | -6 53 45 |
| 3            | 3 | -6 55 00 |
| 4 -6 56 14.5 | 4 | -6 56 15 |
| 5 -6 57 29.5 | 5 | -6 57 30 |
| 6            | 6 | -6 58 45 |

| $\alpha$ : | 1        | 2        | 3        | 4        | 5        | 6        |
|------------|----------|----------|----------|----------|----------|----------|
|            | 16 05 32 | 16 05 27 | 16 05 22 | 16 05 17 | 16 05 12 | 16 05 07 |

Feb 26  $\alpha = 16\ 05\ 20.7$   $-6\ 55\ 16.2$ 

$$\begin{array}{r} 16.2 \\ 37.5 \\ \hline 53.7 \end{array}$$

16 05 33.2 16 05 28.2 16 05 23.2 16 05 18.2 16 05 13.2 16 05 08.2

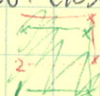
-6 52 08.7  
-6 53 23.7  
-6 54 38.7  
-6 55 53.7  
-6 57 08.7  
-6 58 23.7

|    |    |    |    |    |    |
|----|----|----|----|----|----|
| 11 | 12 | 13 | 14 | 15 | 16 |
| 21 | 22 | 23 | 24 | 25 | 26 |
| 31 | 32 | 33 | 34 | 35 | 36 |
| 41 | 42 | 43 | 44 | 45 | 46 |
| 51 | 52 | 53 | 54 | 55 | 56 |
| 61 | 62 | 63 | 64 | 65 | 66 |

TWO POSSIBLE DITHER PATTERNS.

① For multiple exposures,  
go 75" mosaic.Go to (eg) photo 21, then manually or  
automatically go to 22, 12, 11.② For single exposures (eg the glob. cluster)  
 $3 \times 75'' = 225''$ OR a list of  
36 entries.

|   |   |   |   |   |
|---|---|---|---|---|
| x | x | x | x | x |
| o | o | o | o | o |
| x | x | x | x | x |
| o | o | o | o | o |
| x | x | x | x | x |
| o | o | o | o | o |
| x | x | x | x | x |





# FEB 25 OBSERVING

TO DO TONIGHT:

SET UP - ~065 / objlist.lyoung

FILTER V

NOTES

object

name (prefix) ~~985~~ 25feb

# 1

newer tek 2048

FOCUS

- on 5s or 10s?

- focus (object)

- normal - check centering saturation

- center star focus star, adj exp time

- focus step focus by 5,  $\delta$  by 20"

click near, flush. Manual flush, expose etc.

Pluto

→ 10s

→ slew to Pluto 11

→ stare frame

→ placement? Center P. in zoom window, make zoom box ~800 pix. look at corners.

→ are there 2 stars near P? (see finder chart)

→ At each position (incl. this one)

→ stare frame; → mosaic

~~IF~~ N

+0 0

-75 0

+75 75

0 75

use approx offsets...

faster +

randomizes

bad placement  
(eg use fast slew)

DARKS, ~~Bias~~ 10s, 15s

3:05 arrive Temp = -1.

3:25 T = -0.33 Wind gusts 35 mph NW

Current focus 4845

~~4835~~ 4830 4835 4840 4845 4850

3:54 Jim + Dave refocus ~~4835~~ 4860 T = -0.1

Temperature is changing quickly.

Focus earlier, says Dave J, was 0.6, but now 1.0

4830 0

4835 -20

4840 -40

4845 -60

4850 -80

4855 -100

4860 -130

Time Focus  $\Delta\delta$  FWHM

~~4815~~ 0

~~4820~~ -20

~~4825~~ -40

~~4830~~ -60

~~4835~~ -80

~~4840~~ -100

~~4845~~ -130

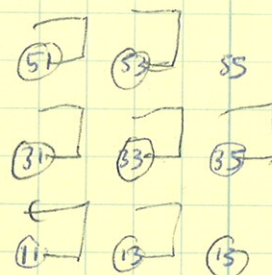


## Feb 25 observing (cont.)

1 focus star (bright star near P)

partial read.

Focus star not saturated. stay @ 15s

2 focus <sup>star</sup> @ 1118, 1024. placement OK

3 focus time

T = -0.01

FWHM

|   |          |      |      |      |      |         |
|---|----------|------|------|------|------|---------|
| a | 14 28 09 | 4845 | 0    | 5.25 | 5.29 |         |
| b | 14 28 46 | 4850 | -20  | 5.25 | 5.38 | 4.96    |
| c | 14 29 59 | 4855 | -40  | 5.38 | 5.96 | 5.2     |
| d | 14 30 37 | 4860 | -60  | 5.96 | 5.57 | 4.9 ← ? |
| e | 14 31 12 | 4865 | -80  | 5.76 | 7.10 | 6.66    |
| f | 14 31 50 | 4870 | -100 | 5.47 | 5.47 | 5.35    |
| g | 14 31 50 | 4875 | -130 | 6.80 | 6.8  |         |

4 focus again

T = ~~-0.01~~ +0.01

| TIME     | FOCUS | FWHM              |
|----------|-------|-------------------|
| 14 43 14 | 4880  | 4830 0 5.3 5.2    |
| 14 44 03 | 4850  | 4840 -20 5.2 5.0  |
| 14 44 32 | 4860  | 4850 -40 5.5 5.4  |
| 14 45 14 | 4870  | 4860 -60 5.6 5.3  |
| 14 46 47 | 4880  | 4870 -80 6.3 6.1  |
| 14 46 17 |       | 4880 -100 6.9 6.5 |
| 14 46 50 |       | 4890 -130 8.2 7.8 |

✓ Delete files from Jewitt + Lou

|   |    |    |    |       |     |
|---|----|----|----|-------|-----|
| 5 | 14 | 55 | 58 | 0     | 0   |
| 6 | 14 | 59 | 10 | 0     | 0   |
|   | 14 | 59 | 49 | -35.3 | 0   |
|   | 15 | 00 | 21 | +75.3 | +74 |
|   | 15 | 01 | 03 | 0     | +74 |

photo 35

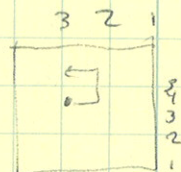


photo 35

7 Time in header same as exposure 6.

time is ~ 5:03 (2 minutes earlier than time of file creation)

photo 33

no stars?

8 15 06 26 0 0

photo 33

FWHM 6.8



Feb 25 observing

FWHM so good - focus again  $T = +0.2$ 

| 9 | Time     | Rows | $\Delta\sigma$ | FWHM | photo 33 |
|---|----------|------|----------------|------|----------|
| a | 15:10:22 | 4825 | 0              | 5.33 |          |
| b | 15:10:54 | 4830 | -20            | 6.33 |          |
| c | 15:11:30 | 4835 | -40            | 5.38 |          |
| d | 15:12:02 | 4840 | -60            | 4.59 |          |
| e | 15:12:27 | 4845 | -80            | 5.12 |          |
| f | 15:12:58 | 4850 | -100           | 5.14 |          |
| g | 15:13:30 | 4855 | -130           | 4.8  |          |

 $T = +0.222$   $+0.25$  @ 5:14Most of the variation must not be due to focus.  
Stay @ 4840

| 10 | Time     | $\Delta\sigma$ | $\Delta\sigma$ | photo 33 |
|----|----------|----------------|----------------|----------|
|    | 15:18:30 | 0              | 0              |          |
|    | 15:19:01 | -74.1          | 0              |          |
|    | 15:19:36 | -74.1          | +75            |          |
|    | 15:20:13 | 0              | 75             |          |

did I slew during last read?

|    |          |   |   |          |
|----|----------|---|---|----------|
| 11 | 15:23:19 | 0 | 0 | photo 15 |
|----|----------|---|---|----------|

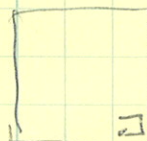
|    |          |       |    |          |
|----|----------|-------|----|----------|
| 12 | 15:25:14 | 0     | 0  | photo 15 |
|    | 15:25:46 | -74.9 | 0  |          |
|    | 15:26:15 | -74.9 | 75 |          |
|    | 15:26:58 | 0     | 75 |          |

 $T = +0.23$ 

|    |          |   |   |  |
|----|----------|---|---|--|
| 13 | 15:29:44 | 0 | 0 |  |
|----|----------|---|---|--|

photo 5, noticable  
(one frame, but in first columns  
mosaic mode)  
photo 51

|    |          |       |    |  |
|----|----------|-------|----|--|
| 14 | 15:31:43 | 0     | 0  |  |
|    | 15:32:13 | -75.2 | 0  |  |
|    | 15:32:44 | -75.2 | 75 |  |
|    | 15:33:24 | 0     | 75 |  |



|    |          |   |   |          |
|----|----------|---|---|----------|
| 15 | 15:35:27 | 0 | 0 | photo 13 |
|----|----------|---|---|----------|

|    |          |       |     |          |
|----|----------|-------|-----|----------|
| 16 | 15:37:41 | 0     | 0   | photo 13 |
|    | 15:38:15 | -75.2 | 0   |          |
|    | 15:38:43 | -75.2 | +75 |          |
|    | 15:39:18 | 0     | +75 |          |



|                                                 |          |       |    |                                 |
|-------------------------------------------------|----------|-------|----|---------------------------------|
| 17                                              | 15:41:18 | 0     | 0  | photo 31                        |
| 18                                              | 15 43 56 | 0     | 0  | photo 31                        |
|                                                 | 15 44 25 | -75.2 | 0  |                                 |
|                                                 | 15 44 50 | -75.2 | 75 |                                 |
|                                                 | 15 45 25 | 0     | 75 |                                 |
| 19                                              | 15 47 33 | 0     | 0  | photo 53                        |
| 20                                              | 15 49 30 | 0     | 0  | photo 53                        |
|                                                 | 15 50 03 | -75.3 | 0  |                                 |
|                                                 | 15 50 34 | -75.3 | 76 |                                 |
|                                                 | 15 51 18 | 0     | 76 |                                 |
| 21                                              | 15 53 19 | 0     | 0  | photo 11                        |
| 22                                              | 15 55 14 | 0     | 0  | photo 11                        |
|                                                 | 15 55 43 | -75.4 | 0  |                                 |
|                                                 | 15 56 11 | -75.4 | 75 |                                 |
|                                                 | 15 56 49 | 0     | 75 |                                 |
| 23                                              | 15 59 03 | 0     | 0  | <del>photo 55</del><br>photo 55 |
| stare mode -<br>sley's up - go to single frames |          |       |    |                                 |
| 24                                              | 16:00:38 | -75.8 | 0  | photo 55                        |
| 25                                              | 16:02:56 | -75.8 | 75 | photo 55                        |
| 26                                              | 16 05 12 | -75.8 | 75 | photo 56                        |
| mosaic mode                                     |          |       |    |                                 |
| 27                                              | 16 07 44 | 0     | 75 | photo 56 mos. mode              |
| 28                                              | 16 10 18 | 0     | 75 | FLAT (30s)                      |
| 29                                              | 16 12 57 | 0     | 75 | FLAT (60sec)                    |
| 30                                              | 16 14 53 | 0     | 75 | Forgot<br>to<br>read out        |



## Feb 25 observing

29-31

~~31-35~~

Darks 15s

32-34

Darks 10s

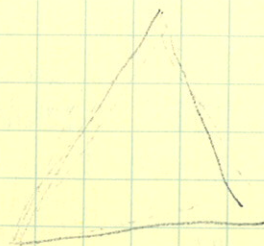
~~35-37~~~~Darks 20s~~

Negotiation w/ Dave —

Leave Mtn @ 16:00

Stop Data @ 15:50

Start Darks @ 15:40



## Feb 25 analysis &amp; Prep.

Data archive plan:

3-4 nights of raw data on 2 tapes each

3-4 nights of cooked data on 1 tape (compressed)

keep all \*imlist, \*.cl, lpcu &amp; in the cooked dir. structure

Only cook Pluto frames

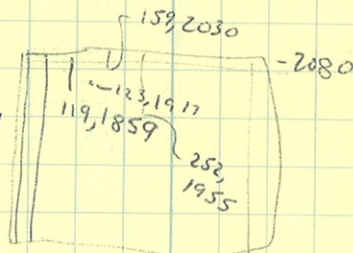
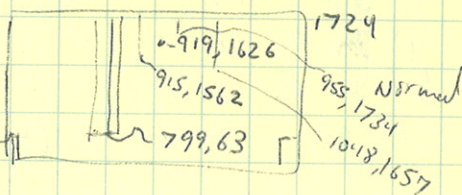
Darks, etc — Feb 22-24 no darks.

Feb 25 → highly darks.

Feb 24<sup>th</sup>'s truncated file:

$$\begin{array}{r} \Delta 7 = 185 \quad 1917 \quad 71 \\ \quad \quad \quad 1859 \\ \quad \quad \quad -1562 \\ \quad \quad \quad \hline \quad \quad \quad 297 \quad 3,62 \\ \quad \quad \quad \hline \quad \quad \quad 291 \end{array}$$

$$\begin{array}{r} 799, 1724 \rightarrow \\ \quad \quad \quad 291 \quad 291 \\ \quad \quad \quad \hline \quad \quad \quad 90 \quad 2015 \end{array}$$



$$\begin{array}{r} 2080 \\ -1724 \\ \hline 356 \end{array}$$

$$\begin{array}{r} 2048 \\ -1724 \\ \hline 324 \end{array}$$

297, 291, 296, 298

Don't use partial frames.

Use post 16:00 UT frames for

median > 800 ( $> 1560 + 800 = 2360$ )1560  
200