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JARNAC OBSERVATORY

LOG 16

January 27 1989

David H. Levy

Comets

8061 AN

7934E Sat 28/29 January / 1900-2100 / 10-F / 3M3 / Minerva / - / CN3 1h 15m W.

7935M 0600-0625 / 10-F / 3M3 / Minerva / - / CN3 0h 15m E.

7936E Sun 29/30 / 1900-2200 / 10-F / 3M4 / Miranda / - / CN3 2h 30m W.

FEBRUARY

7937E 31/1 / 1900-2000 / 3-F / 3M4 / Miranda / - / CN3 30m W.

FEBRUARY

7938M 1/2 2/3 / 0545-0615 / 10-F / 3M4 / Miranda / CN3 0h 20m E.

7939E 2/3 / 1840-0000 / 10-F / 3M4 / Miranda / - / CN3 2h W.

7940M 3/4, Fr. / 0515-0630 / 10-F / 3M4 / Miranda / - / CN3 1h E.

7941EM 0500-0600 / 10-F / 3M4 / Miranda / CN3 1h E

7942EM 0500-0600 / 10-F / 3M4 / Miranda / CN3 1h E

43,4 see after 7933.

*7945M 1/20 ~~21~~ / 0550-0730 / 7-F / 3M3, 3MF / Minerva / - /
ECLIPSE of MOON. Interesting effect
just before sunrise - earth shadow near earth
and partially covering moon too.

7946E 21/22 / 1900-1940 / 3-F / 3M3 / Minerva / - / CN3, 15m W

7947E 22/23/24 / 1900-2020 / 3-F / 3M3 / Minerva / - / CN3 30m W

7948E 23/24 / 1900-2130 / 3-F / 3M4 / Miranda / - / CN3 1h 40m W

7949E 25/26 / 0100-0130 CST / OK City, OK / - / - / general views.

7950E 26/27 / 1900-0000 / 10-F / 3M4 / Miranda / Debbie / CN3 2h W + pic

7951E 27/28/2100-0000/3-F/3M3/Ophelia + Takahashi
sky patrol / Debbie / 2 pictures Orion

7952M March 3/4/0530-0555/3-10-F/3M3/Minerva / - / CN3
0h20mE.

7953EM 4/5/2330-0600/10-F/3M3, 4/Minerva, Miranda / - /
CN3 0h40mE

7954AM 5/6, Sunday / 1900-0540/10-F/3M4/Miranda / - /

CN3 4h00m W, E. List of Comet-like objects:

NGC 2062 M78 (not observed) 5 46.7 + 0 03 ^{15cm} comet-like

3069-70 9 57.9 10 27 id error?

3865 9 58.0 10 22 NGC: Faint...diffuse

5427 11 44.9 -9 14

5668 14 03.4 -6 02

5850 14 33.4 +4 27

6106 15 07.1 +1 33

6118 16 18.8 +7 25

6384 16 21.8 -2 17

6426 17 32.4 +7 04

7793 (not observed) 17 44.9 +3 00 NGC "like a comet"

7955EM 6/7, Mon 11900-0200/10-F(3M4)Miranda / - / CN3 4h00m W.

Add NGC 3049 to list.

*7956S 7/8 Tuesday 11000-1200 / 10-F/3M2/Ophelia,

Welder 14 / PARTIAL ECLIPSE OF SUN. LARGE

Sunspot Group.

With Lumahean + Bourdes.

Replaced drive connector around mid-eclipse; otherwise
a good session, lots of fun!

7957AM 2 1930-0540/10-F/3M4, 2/Miranda, Ophelia / - / CN3: 4h00m W, E

NGC 3069 or 70 was wrong. That galaxy from years back was

M1=11.5; UGC 5373 10h00.0m +5 19 20 V=11.4 IRIV-V 4.6x33'

7958EP 8/9/1915-1925 / 7-F / Tucson Mall / Debbie / Very young crescent moon. 31 hours old.

7959M2 0200-0440 / 10-F / SM4 / Miranda / - / CN3 2.6E. Very fine night. Warm, dry, calm.

7960AN 203 9/10 / 1900-0600 / 10-F / SM2, 3, 4 / Ophelia, Miranda, Miranda.

M42 test

A Gem

B Gem

Pic 1

Hex

Pic 2

0303

M13

5 min

T Max 400

0345

Gerron → 0317

Ophi

5

0350

0330

Oph B

5

0405

0425 M 57 - Lyra region.

First, SM3, visual hunting. Then SM4, then pics with SM2, then SM4, and ending with SM3. CN3 visual = 5^h00^m W, E.

7961AN 10/11 / 1900-0520 / 10-F-3 / ^{SM3} SM2, SM3 / Debbie / "Hamlet" Sky patrol, Ophelia / Debbie

- Debbie's pic of 2, 6, M45 - closest tonight, 15s 30, 1m, 2, 4.8.

CN3p Lambda Gem

1210?

1255

5 min

A Gem

0015

B Gem

0110

Lyra region

6415

CN3 visual 30m, Meneva E.

7962M #11/12/0345-0410/3-F/SMB, F/-/-/3ky inspection.

*7963AN 12/13/1830-0630/3-F/IMH. Bigelow/61"/-/Debbie,
Comets. David Iacobuzia, Steve

CCD	DC Dec	Visual	2" in PA 300° M ₁
Wilson	6.13.21	0505 Shoemaker	89e 13.6
Halleyfield	4.25	0556 Shoemaker	89F 15.0
Yunaka 89a	1.37	0850 P/Parker-Hartley	89i 14.6
	3.40	0940 P/Clark	89h 14.8

*7964AN 13/14/1830-0630/3-F/IMH+Bigelow/61"/Ted Chase
& B. Chase, Steve Larson/-/Comets.

CCD	Visual
Yunaka 88r	DC Time Name Descr M ₁ CD
	4 0830 Shoemaker-Holt 89j ^B 1.2'
	Tail 3" in PA 270, Fanned
	Time 14.36

0000MST. AURORAL GLOW, reddish, in East.

(Weslaw called from 70", we went out, Steve & I, to see.)

7965M 15/15 15/16/3-F/SM4/Miranda/-/CN3 0^h45^m/
0400-0600

7966M 17/18/10-F/SM4/0430-0600/Miranda/-/CN3 10^hE

7967E 20/21/ 2100-2330 / 7-F / SM 2, 3, 4 / Munera, Miranda /

Dear David, Thank you for such an enjoyable time during my first visit to your wonderful home & observatories! You have raised very fine, large cats, which I also admire! Hope you'll be by Westport Point again someday, so I can show you my finally finished "Boosucker Observatory," - John W. Briggs

7968 E

26/27/ 2230-2245 / 3-F / near Wilcox / Munera / Debbie / CN3 10m
0100-0200 / 10-F / SM3 / Munera / CN3 0h 30m W.

7969 M2

27/28 1930-0600 / 10-F / SM 3, 4 / Munera, Miranda /
CN3 5h W, E.

7970 AM

29/29, Tues / 1930-0530 / 10-F / SM 3, 4, 2 / Munera, Ophelia,
Miranda / - / CN3 5h, W, E + pics.

7971 AM

29/30, Wed / 1930-0530 INT / SM 4 / 10-F / Miranda / - /
CN3 2h W, E.

7972 E

30/31/ 32, Fri. / 2200-2215 EST / Kushner Apt / general

7973 M2

0400-0415 / Kushner Apt / small telescope /
CN3 0h 10m E, N. over Lake Ponchartrain.

7974 AE

APRIL 4/5 / 1930-2030-2115 / 10-F / SM 3 /
Munera / - / CN3 0h 30m W.

7975 M2

4/5 / 0400-0515 / 10-F / SM 4, 3 / Miranda,
Munera / CN3 1h E.

7976 E

(before 7968) 23/24 / 10-7-F / SM 3 / Munera /
CN3 0h 15m W.

7977 E

(before 7968) 24/25 / 10-F / SM 4 / Munera / - / CN3 0h 20m W.

7967E 20/21 | 2100-2330 | 7-Fm | SM 2, 3, 4 | Murewa, Miranda |

Dear David, Thank you for such an enjoyable time during my first visit to your wonderful home & observatories! You have raised very fine, large cats, which I also admire! Hope you'll be by Westport Point again someday, so I can show you my finally finished "Boysucker Observatory" - John W. Briggs

7968 E
7969 M2

26/27 | 2230-2245 | 3-F | near Wilcox / Murewa / Debbie | CN3 10^m W
0100-0200 | 10-F | SM3 / Murewa | CN3 0^h 30^m W.

7968 AM

27/28 1930-0600 | 10-F | SM 3, 4 | Murewa, Miranda |
CN3 5^h W, E.

7969 AM

29/29, Tues | 1930-0530 | 10-F | SM 3, 4, 2 | Murewa, Ophelia, Miranda | CN3 5^h W, E + pic.

7970 AM

29/30, Wed | 1930-0530 INT | SM 4 | 10-F | Miranda | CN3 2^h W, E.

7971 E

30/31 | 32, Fri. | 2200-2215 EST | Kushner Apt | general

7972 M2

0400-0415 | Kushner Apt | small telescope | CN3 0^h 10^m E, N. over Lake Ponchartrain.

7973 AM

APRIL 4/5 | 1930-2030-2115 | 10-F | SM 3 | Murewa | CN3 0^h 30^m W.

7976 M2

4/5 | 0400-0515 | 10-F | SM 4, 3 | Murewa, Miranda, Murewa | CN3 1^h E.

7977 E

(before 7968) 23/24 | 10-7-F | SM 3 | Murewa | CN3 0^h 15^m W.

7978 E

(before 7968) 24/25 | 10-F | SM 4 | Murewa | CN3 0^h 20^m W.

7979EP 5/6 APRIL/ 2025-2035/ 7-F/ U of A/ general.

7980M2 0400-0515/ 0300-0530/ 10-F/ SM4/ Miranda
CN3 2^hE.

7981M 6/7 APRIL/ 0400-0530/ 10-F/ SM4/ Miranda/ -/
CN3 1^hE.

7982M 7/8/ 0100-0330/ 10-F/ SM4/ ^{Parasol} Miranda/ -Pete Mandy, Peter
Collins
CN3 1^hE

7983S 0930-0945/ 7-F/ SM3/ Pete Mandy/ -/ ~~ETA~~ Pies of Telescope.

7984MP28/9/ 0000-0010/ 10-F/ SMF/ -/ general.

7985M3 0315-0550/ 10-F/ SM4/ -/ CN3 1^hE. Miranda
Peter Collins. Spectroscopic not yet successful *PLS*

Germany trip - only one short session:
7986EP 24/25/ 2300-2310 local time/ -/ ~~ETA~~ hazy clear, some
stars from downtown Bamberg.

7987M ~~30~~²⁹/30/ 05400-0420/ 3-F/ SM3/ Minerva/ -/ CN3 10^mE.

7988E 2/3/ 1930-2200/ 3-F/ SM4/ Miranda/ CN3 1^h00^m E W.

7989M2 2/3/ 0330-0430/ 3-F/ SM4/ Miranda/ CN3 0^h45^mE.

7989OM 3/4/ 0030-0045/ 3-F/ Tucson/ -E. For Eta Aquarids. None seen.
Sky full of light cirrus.

7991M 3/4/ 0330-0430/ 3-F/ ^{SMF} SM4/ Miranda/ -/ CN3 0^h50^mE.

Also, watch for Eta Aquarids. 1 bright tel. meteor.
7992M 4/5/ 0400-0430/ 3-F/ SM4/ Minerva/ -/ CN3 0^h20^m CN3, E

7993AN

Fri May 5/6/1930-0430/3-F/ME Bigelow/-61"/
 Michael Magge until ~ 0100/ In the last few days
 acts of vandalism against Steward Observatory on
 Kitt Peak and Tumamoc Hill, have and warnings
 of an imminent "attack" on another facility
 have caused us to get very nervous up here.
 The feeling is that vandalism will be directed
 at facilities, not people, and that I will be
 ok up here. They have asked that I not leave
 until the run is over, since the presence of
 someone on site may prevent vandalism.
 So far, 0255, all is quiet.

Observed P/Pons-Winnecke, P/Gunn,
 P Yamaka - all CCD only.

7994AN Sat May 6/7/1900-0530 / 3-F/M+Bigelow 161"/Debbio/

#2345

Visual sighting:
 P/Pons-Winnecke

2350 0650 UT

M1 = 16.0°

DC = 4 Coma 10"

+ P/Gunn, ? P/Halley
 w/CCD

7995EM Same Monday 8/9/ 2000-0500INT/ 3-F/5M4/
Miranda/-/ CN3 2^hW, E.

7996M Tuesday 9/10/ 0230-0430/ ~~3-F~~ 10-F/5M4/ Miranda/H
CN3 1^h35^mE.

7997SP Wed 10/11 / 1820-1830/ 3-F/ near PSI, Tucson/
-/ Michael Magee / Beautiful Sunday.

Two sun dogs, one to the north which was brighter and
one to the south (each about 30° from the sun). The north
one gradually grew fainter as the southern one grew brighter. Both
exhibited a rainbow effect.

7998E2 2050-2120/ 3-Fm/ 5M3/ Minerva/ -/ CN3
0^h10^mW.

7999M3 0350-0430/ 10-F/ 5M³/ Minerva/ -/ CN3 0^h20^mE.
Nice night.

8000E Friday 26/27/ 10-F/ RIVERSIDE: MINERVA
Debbie Smith, Charles Morris,
Steve Edberg, Cliff Holmes, Askley ...
CN3 0^h30^mW.

8001E Saturday 27/28/ 10-F/ RIVERSIDE: MINERVA
Debbie, Charles, Duane ...
CN3 0^h30^mW.

8002M Sunday 28/29/ 10-F/ RIVERSIDE: Steve E,
Charles Oostdyk

8003~~ME~~ Mon 29/30 / ~~0000-0015~~²⁰³⁰⁻²⁰⁴⁵ / 10. (near Cala Bend / Mureria)
Debbie / CN3 5^mW.

JUNE

8004M Wed 31 June / 0000-0300 / Texas Star Party /
Mureria / Dave Eicher, Brian Skiff, Stewart
Amelia Goldberg.

8005EM Thurs 1/2 / 2300-0300 / Texas Star Party / ^{14" 13" - Andlight} Mureria /
CN3 0^h30^m E N, E.

8006AN Friday 2/3 / 2200-0600 / 7-10-0-3-F ITSP / Mureria
24", 13" / CN3 3^h N, E with the 3 telescopes

8007FM. Saturday 3/4 / 2330-0300 / 3-10-F ITSP / Mureria.

8008MR 0600-0610 / 7-F / TSP / Mureria / CN3 5^mE.

8009~~EM~~^{SP} Monday 5/6 / ~~03~~¹⁸⁰⁰⁻¹⁸⁰⁵ / EL PASO / CN5 SUN. UC-V
8010MP2 1000-1010 / " / general session.

8011M3 0335-0350 / 10-F / E of Bowie, Az / Mureria CN3 10^mE.

* 8012M Wed 7/8 / 0300-0400 - Miranda. ^{SM2, OPHELIA & PEGASUS PICTURES} CN3 0^h15^mE.

8013M 9/10, Fri / 300-400 / 10-F / SM4 / Miranda / CN3 0^h30^mE.

8014AN 10/11, Sat / 2000-0400 / 10^F-F / Astro. Vista, then Duane's,
then SM4 / Mureria, Miranda CN3 2^h15^mW, E.

* 8015M 11/12, Sun / 0300-0400 / SM4 / Miranda / CN3 30^mE.

8016M 12/13, Mon / 0200-0240 / 3-F / SM4 / Miranda / CN3 30^mE.

8017M 13/14, Tues / 0300-0400 / 3-F / SM4 / Miranda / CN3 0^h40^mE.

8018M 14/15, Wed / 0200-0300 / 3-F / Southwell R.

8019~~ME~~^E June 15/16, Thurs / 2100-2230 / 7-F / Mt Lemmon / 60" / -UA Astro Camp
Peter Collins, Billy Levy, Don McCarthy, David Garavito.

8020 M2 0300-0430/9½-F/SM4, JMB/ ^{Fanda} ~~Miranda~~, Penelope,
Perseus/CN3 0^h45^mE. SSCyg 11.9
Helko - I'm Peter Collins, and I used one of your fine telescopes
tonite and it was fine PJC

A fine early summer sky. The Milky Way is
blazing. - Andy Rudeen - 8022E

SUMMER of 1989!!!

8021E Wednesday, June 21/22/2030^{2¹⁵}-~~2~~ 3-F/MT Hopkins
visitor's site / -1 CN3 1^h10^mW. Minerva.

8022E Thurs 22/23/2030-0130/10-7-F/SM4, 3, A. Rudeen's
house / -1 CN3 - 0^h45^mW. Miranda, 10" Coupler.
8023E Changed Ophelia B with Ophelia A. Almost fell
out of mount. I caught it but injured my fingers.
Fortunately camera is o/k.

Friday 23/24/2030-2300/10-F/SM4/
Miranda / -1 CN3 2^h W, E.

8024E Sat 24/25/2040-2330/10-F/SM4/
Miranda / -1 CN3 2^h E

8025E Sun 25/26/2020-0000/10-F/SM4/
Miranda, Ophelia / CN3 1^h40^mW

8026M Mon 26/27/0330-0400/ 3-F/SM4/Miranda / -
CN3 0^h35^mE.

8027M 27/28/ 0035-0150/3-F/SM4, JMF/
Miranda - CN3 0^h30^mE. Search for
P/Brosson-Metzalf.

SUMMER '89

- 8028AN June 30/31/ 1850-0430/ 10-F/Bigelow/Steve
61" Several comets Spectacular CCD
image of P/SW1 + NGC
- 8029AN June 31 - JULY 1/ 1830-0530/ 10-F/Bigelow 161"
Steve Several comets. Saturn near 28 Sgr
thru finder. (6" m)
- 8030E JULY 1/2/ 2040-2120/ 10-F/SM3/Miranda/-/
CN3 0h 15m W. Also Saturn even closer to 28 Sgr.
- 8031M2 0330-0415/ 10-3-F/SM3/Miranda/-/
CN3 0h 40m E

- *8032EM 2/3/ 2035-0405 / 10-F/SM4/Miranda/-/ just me -
Occultation of 28 Sgr by Saturn. Just enjoying it
2300-2314 Many findings + disappearances
UT 0600hrs Saturn's A ring passed by. Star disappeared
completely just before Cassini's division passed
it, then fully visible while going division
in front. Faded sharply after.

Seeing variable.

- 6:37 28 Sgr behind C ring
6:38:45 disappears, then brightens
6:40:30 dimmed for 5 secs
6:42 - Star bright, between C ring + planet.
6:51 45 28 Sgr starts to disappear behind J. Taken
~ 20 seconds for fading!

UT 8:38 Star well into space betw planet & C ring
8:45:15 slight fading
8:45 51 - sharp disappearance in C Ring, 3 seconds
8:47:52 - sharp disappear - reappeared after 1 second
8:49 - in B ring row

9:14 - "leaves" Cassini division (Cassini Division leaves star); row in A ring orbit.

9:22:45⁺ brightens, fades

9:23:28 brightens a lot leaves A ring (not quite)
leaves star by 9:25.

9:27:40 - ? slight fading. Fring? beautiful night

CN3 30^m E, Minerva.

8033M Tues 11/12/0330-0400/3-F/3M4/Minerva/CN3 20^mE

8034M Wed July 12/13/0315-0400/3-F/3M4/Mir/CN3 40^mE

8035E Thurs, July 13/14/1100-1200 pm ~ Tucson / bike ride

8036M 0300-0430/10-F/3M4/Minerva CN3 1^hE

8037EM Fri July 14, Bastille Day 2350-0130 / bike ride

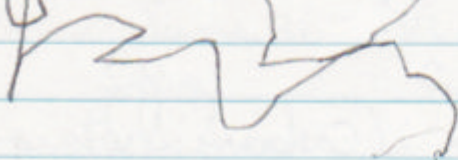
8038AS ~~Thu July 20~~ / Monday July 17.

11:30-12:30 / 7-F/3M4/

Aunt Elaine, family

see overleaf.

7/17/89 Alan Schuch's wonderful collection!
NOCTILUCENT CLOUDS SW NW

7/17/89 Alan Schuch Had a great time counting sun spots!


8039EM Thursday, July 20 / 20 years after landing
0100-0130 / 7-F / U. of E. Washington /
Minerva / Binoco / Steve O'Meara, Peter
Collins. CN III 5min E.

*8040M Sat July 22 / 0000-0030 / 3-F / Alister's
Wedding reception at Fort Edmonton -
NOCTILUCENT CLOUDS low in N.
Two bright layers, lower one brighter.

8041M Sun July 23 / 0000-0030 / 3-F / The Brecken-
ridge house / 3-F / Minerva, 11x80cm mount
CN3 0h05m NW M13, M13, M13, M13, M13
Cluster. Alan Dyer, Bob Brinkley,
Cathy Breckenridge

8042E Wed July 26 / 2300-0130 / 3-F / Lake George /
5' F / 4, Minerva / Larry, Mark / CN3 3h14m W.
While trying to align Larry's telescope,
the tube fell off the mount. Tube was bent
but all optics are ok. Terrible.

8043EM\$ Friday 28/2230-0100/9^h-10-F/
Orms town Site/Minerva - 8" Celestron / Louie
Bernstein / CN3 2^h W. M22,
M72, 73, 31, 11.

8044M Sat 29/0200-0215/3-F/Westmount Hill

8045M2 Sun 30/0000-0100/7-F/Summit Walk

8046E (before 8045) /2000-2100 or so /Greasy House /
Maw, Gerry, Audrey, Michael, Daniel
~~Maw~~ Michael did a sketch of 'UMA + 2 Pos.

8047M Mon 31 / 2230-0100/10-9-F/Orms town
Site/Minerva / - Lisette Shashona / CN3 30^m W

8048M Tues August 1 / 0200-0330/3-2-F/
WHS-818 / Summer A etc.

8049EM Sat Aug 5/6/2100-0300/3-2-F/STELLA FANE/
Minerva + many other scopes / CN3 5^m only.
P/Bransen-Metcalf.

8050MP 6/7/0100-0105- / 7-F (clouded over later) / Pouch on
Mother's House on Atwater.

8051M 8/9 10 / 0230-0415/10³-F-13M4/Miranda / - / CN3 1^hE }
8052M 9/10 0330-0430/3-F/13M4/Miranda / - / CN3 / 40^mE. }
8053MP 11/15/160430-0440/3-F/13MF/Pandora. CN5. }
~~8054~~

Comet P/Brorsson-Metcalf
on both nights, tail 3/4°

*8054EM Aug 16/17/1900-2230 / Tucson to Painted Rock Road,
W. of Gila Bend, AZ / Echo, Pandora / Peter Collins.
We left Tucson under solid clouds from bus
stn. Forecasts showed W was best. Beautiful
lightning on I-10, huge massive lightning storm
- some rain - on I-8. Immediately after
rain stopped sky cleared from W; we saw
Moon just after 3rd et contact. 285%
still covered. We set up on roadside,
observed marvellous sky with lightning +
eclipsed moon. Then we ate at Space Age
Restaurant.

Wish uniquely the lunar eclipse of 16-17 Aug 1989 -
lighting + partial phase, wonderful

8055E. Sat 19/20/2030-2200 / 10-3-F / SM4 / Mimeriva (-)
CN3 0h40m W.

8056E Sun 20/21/2000-2200 / 10-F / SM4 / Mimeriva /
Andy Rudeen / CN3 0h45m W. M57, Veil.

~~Mon~~ Monday
8057MS Mon 21/22/0300-0600 / 10-1-2-10-F / Jnt Bigelow)
61" / Steve / Br-Metcalfe with H₂O⁺ filter
barely before twilight came too bright

8058AN ^{Tue} Tue 22/23/2000-0600 / 10[↑]-F / Mt-B / 61 / Steve
Yanuka, P/Brorsen-Metcalfe with 6/9 H₂O⁺
filter, fabulous changes in tail Rays changing
over few minutes. Neptune view

wed
 8059AN 23/24/2000-0600 / 10⁻⁷-f / Mt Bigelow / 61 / Steve
 1989 PB - very very fast moving object.
 Found it somewhat surreptitiously via
 CompuServe (As Skytel news), then positions (hourly)
 (1°/hr motion) via Brian + MPCs, followed
 by Steve's interpolating. We took many
 pictures at 21.3 position, in hopes of "trap setting"
 a trap. It worked - framed image in 30s
 exp at upper right. ^{Put up biases - then} took images, then
 saw moving object in through eyepiece -
 it was moving very rapidly.

P/Lovis 1 - 0245 am - M1 = 16.3° . 1' diam
 DC = 5.

P/BrM not in active or changing as last
 night.

Thurs

→ 25.21

~~8060AN~~ 24/25/2030-0600 / 10-f / JMY / ~~AN~~ Miranda 1- /
 CN3 1^h 15^m W. - Suspect 5UT 15^h 27.7^m +34° 12'
 Neptune encounter seen almost all night
 on TV inside. Blue spot. Triton /
 CN3 Pics of P/BrM, pos development,
 taken w/ Ophelia.

Fri Aug

~~8061AN~~ 25/26/2025-0600 / 10-f / JMY, JMB / Miranda, Ophelia /
 - / CN3 1^h 15^m W. Confirmed new comet.
 26.16 at RA (1950) 15^h 25^m .6 +34° 11'
 M1 = 10.5



Charley Morison at Pine Mtn. Club, CA
 (26cm refl.) Aug 26.289 15 25.1 +34 13'
 M1 = 10.7 3.3 arc min DC-1-2 enhanced
 by Sweeney and

Called Charles Morris, a few seconds after I finished, Mike Rudenko called him with suspect. Charles said "Let's see. Is it at $15^{\text{h}}25^{\text{m}}+34^{\circ}$? Later, Mike called me - "We've gotta stop meeting this way!!"

P/Brorsen-Met call Schmidt pictures - all came out very very well. CN3F.

8062AN ^{Sat} 26/27/2000-0500/10-F/JM4/ some clouds/ - Muranda/ CN3 0^h10^mW. - Comet Levy-Rudenko 1989r. P/BrM pic.

8063AN 0445 UT 1989r Levy-Rudenko $M=10.4$
CD 2:5' Tail θ in PA 70° DC=2 ^{Sun} 27/28/2000-0500/10-F/JM4/ some clouds / Michael Magee / CN3 Intermittent.

Number 5 and still counting. An average of one per year ain't bad, so keep up the good work. Congratulations! Michael Magee

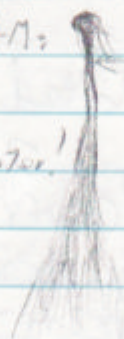
*
8064AN ^{Mon} 28/29/2000-0500/10-F/18" Schmidt, Mt Palomar/ CAROLYN SHOEMAKER/ CN3G - night of photography 24 pictures obtained. I did most of the guiding and moving the telescope to the objects. It was a very pleasant experience, except when our first 4 or so pics (not counted among the 24) were developed and only a tiny fraction came out. Carolyn had forgotten to put one more than a tiny amount of D19 in the developing tank. Then, other than loading one of those bad films backwards, I did o.k. - guiding was o.k.

8065AN Tuesday August 29/30/1900-0530/10-F/
Mt. Palomar, B. Schmidt / Carolyn Shoemaker /
CN3G: 39 pictures. - start with 1989r,
Levy-Rudenko, ending with 1989o,
P/Brossen-Metcalfe attend, we went to 200"
and saw telescope, windopen dome, + Cassiopeia

8066M Wednesday Aug 30/31/0350-0530/10-3F/
JIT KOBAN / Ken, HW + Linda, Alan Dyer,
Bob + Cathy Breckenridge, Steve Bucek,
and many others / Minerva! / CN3
0h45m E.

8067AN Thursday, Aug 31/Sept 1/2000-0600/2-3-F/
Mt KOBAN / The Mount Koban Star Party / Myneve
CN3 2h E Comet 1989r Levy-Rudenko AND

P/Brossen-Metcalfe with Ken's 7 1/2-inch
telescope: P/B-M:
- Alan Dyer
Good seeing on Jupiter!



split
~1 1/2° from head to middle of beam
beam very faint

8068SEM Fri Sept 1/2/1600-0130/3-0-F/Mt Koban /
Mt Koban Star Party / Several enormous
synspp groups. Then lots of rain,
a few stars.

*8069AN

September 2/3, Sat/2000 - 0550/3-10-F/III
Mt Kobau / Mt Kobau Star Party / Minerva,
20", 36" reflectors.

CN3 [2^h 5^m]^W with Minerva.

Comet Levy - Rudenko through
Ken's 17 + Minerva. Comet much
brighter, more condensed.

CN3F with Bob Breckenridge's 5"
Celestron Schmidt Camera

4 fields: α Aur 4 min, 4 min (~0100, ~0135)

Aur " (~0105, ~0145)

M45 4,5 (~0115, 0158)

β Per 4,4 (~0120, 0207)

CN3 with 36" + 2 refl. [1^h 45^m]^E

CN3 with 20" refl [0^h 10^m]^E

CN3 Total for night = 4^h 00^m
2 suspects

John, Jane + Eric Casino - Olympia Wash
36" F 4.17 Newtonian Reflector

Looking forward to Number 6!

We're honored that you used C^{III}

Jerry Lotey, Allyn, Wash. (Tucuma Astro Society)

20" f 5' Dobsonian - happy to share
eye piece time with you - hope to see
you next year

Ken Hewitt White - a joy to watch a comet with
its discoverer right next to me! A first! Cheers!

You are one of the nicest people I have ever met. I really enjoyed your talks. I hope you enjoyed yourself. Good luck in your search

Frick Utter - Mt Kobau 1989.
(President)

DEAR DAVID

THANKS FOR GIVING ME THE PLEASURE TO HAVE YOU TWICE - IT WAS LIKE CHRISTMAS. I DO HOPE TO HEAR YOU AGAIN, IF NOT I WILL READ YOUR WORDS!

Bill Iden
MT. KOBALU 1989

8070AM Sun Sept 3/4/1900-0600 / 10-F / Mt Kobau /
The Mt Kobau Star Party / Minerva 36" reflector /
- 1 CN3 (2^h 5^m) West, North with Minerva
then meteor watching sort of
CN3 (2^h 20^m) East with 36"

Then 4^h 25^m ~~total~~

Notarized with glasses R. Breckering
Sept 3-4/89

Dear David,

How wonderful to share the skies with you - especially seeing your latest child in the 36" - Happy Hunting til we meet again.
Love,
Early B.

8071M Wed ~~8~~ Sept 6/7 / 0400-0500 / 10-F / JMY / Miranda 1- /
CN3 0.20^m E

8072M Thu 7/8 / 0430-0500 / 10-F / JMY / Miranda 1- / CN3
0.20^m E

8073M Fri 8/9 / 0030-0100 / 9-F. . 6" reflector, looking at DbCh⁴
It was great to have you visit with us here ^{M31.}
in Connecticut. I hope you come back soon,
Cordially, Suzanne Mariani

8074E Sat 9/10 / 2200-0000 / 74-F / Wesleyan Observatory /
Amateur Astronomers of Greater Hartford.

The chance to meet and speak with you will
remain one of the highlights of my being
an amateur astronomer

Sincerely, Jay Sattolon

Now you have made your visit to our house and
have seen what our sky is like at 3am on a
Saturday night you will have to come back to
stay longer and look thru my telescope next time.
it should be up and operating then.

Mike Wether

P.S. David does not know about this entry
because he forgot to take this book along
so I will hold it for ransom, he must
pay me one observation then my soap.

8075M Sun 10/11 / 0000-0100 ~ / 3-F / Steve + Donna O'Meara's
house / Steve doing Nova Search:

8076.

A special session in several parts

CN 3E:

- Part 1: Monday, Sept 11, 8:45-11:45 a.m.
- Part 2: 4:30-5:00 p.m.
- Part 3: 9:30-10:30 p.m.
- Part 4: Tuesday, Sept. 12. 9:00-11:45 a.m.
- Part 5: 3:15-5:00 p.m.
- Part 6: Wednesday, Sept. 13 9:55-12:00 am (Cross)
- Part 7: 1:30-2:30 p.m.

Place: Harvard College Observatory, Plate Stacks.

Assistance: Martha Hazen, Steve O'Meara

Purpose: Looking at plates of Corvus for ~~out~~ confirming evidence of a nova that Clyde had found. It had been forgotten until I found his envelope note last year.

Obsvtn.

No.	Date	J.D.	Series	Comment
1	1 Mar 1930	2426036	RB	
2	15 Feb 1931	387.842	"	
3	11 Mar	411.500	"	
4	18 Mar	418	380 Lowell	} UT.
5	21 Mar	421	383 Lowell	
6	23 Mar	2426423	385 Lowell	
7	7 May	468.396	RB	
8	16 May	477.346	"	
9	22 May	483.347	"	
10	16 July	538.219	"	
11	16 Jan 1932	722.527	"	
12	19 Jan	725.589	"	

2076.

CN 3E:

A special session in several parts

Part 1: Monday, Sept 11, 8:45-11:45 a.m.
 Part 2: 4:30-5:00 p.m.
 Part 3: 9:30-10:30 p.m.
 Part 4: Tuesday, Sept. 12. 9:00-11:45 a.m.
 Part 5: 3:15-5:00 p.m.
 Part 6: Wednesday, Sept. 13 9:55-12:00 am (noon)
 Part 7: 1:30-2:30 p.m.

Place: Harvard College Observatory, Plate Stacks.

Assistance: Martha Hazen, Steve O'Meara

Purpose: Looking at plates of Corvus
 for ~~out~~ confirming evidence of a nova
 that Clyde had found. It had been
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5	21 Mar	421	383 Lowell	
6	23 Mar	2426423	385 Lowell	
7	7 May	468,396	RB	
8	16 May	477,346	"	
9	22 May	483,347	"	
10	16 July	538,219	"	
11	16 Jan 1932	722,527	"	
12	19 Jan	725,589	"	

8076.

No.	Date	J.D.	Series	Comment
13	2 Mar 1932	2426768.528	RB	Outburst 2 M-12
14	31 Mar	797.442	"	
15	5 Apr	802.671	"	
16	13 May 1932	840.352	"	
17	25 Feb 1933	2427 128.720	"	
18	29 Mar 1933	160.731	"	
19	30 Mar	161.587	"	
20	27 April	189.609	"	
21	18 May	210.355	"	
22	11 July	264.122	"	possible (faint stars on plate)
23	9 Feb 1934	477.801	"	
24	18 Feb	486 -	"	
25	7 Mar	503	Tombaugh (X261.)	[(16.5)]
26	9 Mar	505	"	
27	11 Mar	507	"	
28	14 Mar	510	"	
29	17 Mar	513	"	
230	18 Mar	514	"	
31	27 Mar	523.440	RB	
32	11 Apr	538.678	"	
33	9 May	566.278	"	
34	14 May	571.355	"	
35	18 May	575.312	"	
36	3 Jul	621.224	"	
37	31 Jan 1935	833.496	"	
38	1 Feb	834.850	"	
39	2 Mar	863.490	"	
40	5 May	927.620	"	
41	29 May	951.274	RB	AI, BI scale not greatly sufficient
42	29 Dec 1936	2428 165.508	AI, BI.	
43	Apr 1936	2428 259.508	RB	
44	18 Apr	276.473	"	
45	15 July	364.233	"	

No	Date	SD	Series	Comment
46	10 Mar 1937	2428602,531	RB	
47	29 May	682,228	"	
48	10 Jul	724,235	"	
49	1 Feb 1938	930,557	"	
50	10 Mar	967,529	"	
51	3 May	2429021,581	"	plate flw near obj.
52	4 May	023,321?	"	
53	16 Jul	094,232	"	
54	9 Jan 1939	272	"	Faint plate
55	10 May	9393	"	
56	14 May	397	"	
57	28 Jul	42	"	
58	7 Jan 1940	635,898	"	
59	16 Jan	644,822	"	
60	4 Feb	663,821	"	
61	12 Feb	671,797	"	Outburst 3 M=12
62	12 Mar	700,723	"	
63	10 May	759	"	
64	16 July	826	"	
65	30 Jan 1941	2430024,827	"	
66	5 Feb	030,813	"	Outburst 4 M=12
67	20 Mar	073,705	"	
68	22 Mar	075	"	
69	23 Mar	076,626	"	
70	28 Mar	081,681	"	
71	4 Apr	088,659	"	
72	15 May	129.	"	
73	22 May	136.	"	
74	27 May	141	"	
75	21 Jan 1942	380.	"	

No.	Date	JD	Series	Comment
76	30 Jan 1942	2430389.	RB	
77	18 Mar	436	"	
78	26 Mar	444	"	
79	19 Apr	459.	AI, BI	→ JD on envelope says 547, which is correct?
80	19 Apr	463.662	RB	
81	4 May	483.592	"	
82	6 May	485.612	"	
83	8 May	487.	"	
84	13 May	492.	"	
85	20 May	499	"	field at edge: (position slightly wrong plate off center)
86	16 July	557.	"	
87	11 Jan 1943	735.	"	
88	11 Jan	735.875	"	(same night)
89	18 Jan	742	"	
90	19 Mar	802.	"	
91	6 MAY	850	AM	
92	27 MAY	871	RB	
93	26 Jun	901.	AM	
94	22 Jan 1944	2431111.	RB	
95	6 Mar	155.	"	
96	18 May	228.	"	
97	13 July	284	"	
98	8 Mar 1945	522	"	
99	9 Apr	554	AM	
100	11 Apr	556.	AM	
101	13 Apr	558.	"	
102	3 May	570.	AX	
103	3 May	578.	RB	
104	4 May	579.	AX	
105	9 May	584	"	
106	17 May	592	RB	

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No.	Date	JD	Series	Comment
107	31 May 1945	2431606.	RB	
108	2 Jun	608.	AM	
109	28 Jun	635	"	
110	5 July	641.	RB	
111	10 July	646.	"	
112	20 July	656.	AX	
113	10 Aug	678.	AM	poor
114	8 Dec	797	"	poor
115	12 Jan 1946	832	"	
116	30 Jan	850	RB	
117	4 Mar	883	"	
118	9 Mar	888	"	
119	29 Mar	908	"	
120	Apr 8	918	AM	possible; M=13. #25380
121	26 Apr	936	AX	
122	29 Apr	939	AM	
123	30 Apr	940	"	
124	2 May	942.640	RB	
125	6 May	946		flow near obj.
126	27 May	967	AX	
127	22 June	993	AM	
128	2 July	2432 003	RB	
129	9 July	010	"	
130	20 July	021	AX	
131	3 Jan 1947	188	RB	
132	4 Jan	189	"	
133	20 Feb	236	AX	
134	19 Mar	263	RB	
135	25 Mar	269	"	
136	10 Apr	285	AX	

8076

No.	Date	JD	Series	Comment
137	15 Apr 1947	2432290	AM	
138	18 Apr	293	"	
139	13 May	318	RB	
140	20 May	325	AX	
141	22 May	327	RB	
142	26 May	331	AX	
143	11 June	347	AM	
144	14 June	350	"	
145	18 June?	(marked 262)	"	(date uncertain)
146	19 June	355	"	possible
147	10 July	376	RB	
148	22 July	388	AX	possible
149	7 Feb 1948	588	RB	
			AX	
150	19 Feb	600	AM	possible M=13
151	6 Mar	616	AX	
152	31 Mar	641	RB	
153	28 Apr	669	AX	
154	6 May	677	RB	
155	3 June	705	AM	
156	2 July	734	RB	
157	3 Mar 1949	978	RB	
158	20 Mar	995	AX	
159	4 Apr	243300	"	
160	2 May	038	RB	
161	18 May	054	AX	
162	26 May	062	RB	
163	17 Jun	084	AM	
164	27 Jun	094	"	
165	30 Dec 1949	273	RB	
166	15 Jan 1950	290	"	

DSB = Damon South Blue Y = Yellow

1 infera RA 12^h45^m Dec -15°
 2 " RA 12^h00^m Dec -30°. as center.

8076

No.	Date	SD	Series	Comment
167	26 Jan 1950	2433308.	AX	
168	27 Mar	367.	RB	
169	9 Apr	380,641	"	
170	7 May	408,624	AX	
171	6 July	468.	RB	
172	16 July	479	AX	
173	2 Mar 1951	707.	AM	
174	9 Apr	745,678	AX	
175	? Date	764,678	RB	
176	7 July	834.	AX	
177	25 March 1952	2434096.	AX	
178	21 April 1952	123	AM	Outburst 5 M=12.5
179	22 May Jan 1953	399	AX	
180	10 MAR 1953	446	AX	
181 ²	7 MAR 1954	808.	POSS O/E 1007	M _B =(7-18)
182	7 MAR	808.	POSS	M _R =19
182 ^{1/2}	6 MAR 1970		STELLARUM	
183	29 Apr 1970	2440705.	DSB-2	
184	5 May	711.	DSB ² (blue)	
185	5 May	711.	DSY-2 (yellow)	
186	9 May	715.	DSB-2	
187	30 May	736	"	
188	1 March 1971	2441011.	"	possible
189	20 April 1971	2441061.	"	Outburst 6: M _B =13.5
190	20 April	061	DSY	fainter BUT visible
191	27 April	068	DSB-2	NOT VISIBLE
192	17 May	088	"	
193	18 May	089	"	
194	19 May	090	"	
195	25 May	096	"	
196	29 May	100.	"	
197	16 Apr 1978	2443614.719	DSB-1	

8076

No.	Date	JD	Series	Comment
198	14 May? 1978	2443612.731	DSB-2	
199	16 May?	614.584	"	
200	5 July	694.542	"	
201	28 Jan 1979	901.802	"	
202	29 Jan	902.826	"	
203	26 May	2444019.513	"	
204	29 May	022.616	DSB-1	
205	8 Feb 1981	644.033	DSB-2	Fuzzy
206	5 Apr	699.963	"	
207	24 May	748.850	"	
208	26 Mar 1982	2445055.005	"	
209	20 April	079.001	DSB-1	
210	14 June	134.869	DSB-2	
211	13 Dec	317.086	"	
212	10 Feb 1983	376.062	"	doubtful outburst
213	22 Feb	388.025	DSB-1	Outburst 7 $M_B = 13.0$
214	7 April	432.035	DSB-2	
215	17 Apr	441.996	DSB-1	
216	3 June	488.886	DSB-2	
217	3 Jan 1984	703.116	"	
218	28 Jan	728.135	DSB-1	
219	6 Feb	737.116	DSB-2	
220	26 Feb	757.055	DSB-1	
221	1 Apr	791.907	DSB-2	
222	9 Apr	799.993	DSB-1	
223	22 Apr	812.900	DSB-2	
224	3 May	824.011	DSB-1	
225	20 May	840.836	DSB-2	
226	21 June	872.887	DSB-2	
227	18 July	899.839	DSB-2	
228	16 Feb 1985	244610.030	"	
229	15 MAR	149.030	"	Outburst 8 $M_B = 13.0$

8076

No.	Date	S.D.	Series	Comment
230	27 Mar 1985	2446152.044	DSB-1	
231	15 Apr	170.993	DSB-2	
232	23 Apr	178.948	DSB-1	
233	10 May	195.864	DSB-2	
234	24 May	209.888	DSB-1	
235	8 June	224.897	DSB-2	
236	16 June	232.865	DSB-1	
237	9 Feb 1986	471.152	"	
238	7 Mar	497.000	DSB-2	
239	17 Mar	507.074	DSB-1	
240	6 Apr	526.960	DSB-2	
241	15 Apr	536.021	DSB-1	
242	12 May	562.939	DSB-1	
243	3 June	584.898	DSB-2	
244	12 Jul	623.822	DSB-1	
245	10 Feb 1987	837.154	"	
246	24 Feb	851.149	DSB-2	possible, doubtful
247	6 Mar	861.096	DSB-1	Outburst 9 M _B = 13.0 _s
248	24 Mar	879.002	DSB-2	possible!
249	2 May	918.011	DSB-1	
250	29 May	944.865	DSB-2	
251	17 June	963.872	"	doubtful
252	21 June	967.915	DSB-1	
253	29 Jul	2447005.790	DSB-2	
254	21 Jan 1988	182.082	DSB-2	possible
255	20 Mar	241.010	"	
256	10 Apr	262.027	DSB-1	
257	15 Apr	267.068	DSB-2	
258	21 Apr	272.973	DSB-1	
259	21 May	302.922	DSB-1	Outburst 10 M _B = 13.0 _s
260	15 June	327.867	"	

8076

No.	Date	JD	Series	Comments
261	7 July 1988	2446267.068	DSB-2	
262	18 July	362837	DSB-1	poor plate

Total No. Observations 262, including 2 Pass plates
 Dates 258
 Series 6 including AI+BI,
 AM,
 AX,
 RB,
 Tomlaugh,
 Pass.

8077E Friday 15/16 Sept / 2030-2100MDT / Walter Haas's house / Spica / Saturn.

8078SP Sat 16/17 / 1030-1040/10-F / El Paso / - / CN5 Sun Ven.

8079E Sun 17/18 / 2000-2100/3-F / SM4 / Miranda / - / CN3
 0^h30^mW.

8080E Mon 18/19 / 2000-2130/10-F / SM4 / Miranda / - /
 CN3 ~~EA~~ 1^h10^mW.

8081SP Tues 19/20 / 1020-1030 / 3-F / Sun Ven.

8082M ~~2000-0100-0200/11-F / 7-F / SMF + South walk.~~

8083E Wed ^{20/21} ~~210~~ 2025-2240/10-F / SM3 / CN3 -
 Minerva 2^h00^mW. Independent

discovery of Comet 1989r Okazaki - Levy-Rudenko.

8084AN ~~Wed~~ ^{Thurs} 20/21/22/1900-0630 / 10-7-Fm / Mt.
Bigelow 161" Steve Larson / Comets
Okayaki-Lacy-Rudenko, P/SW-1, Moon
under F/27 configuration.

8085AN^{EM} Fri 22/23/1900-0200 13-1 F/Mt Bigelow / 61"
Steve Larson, 1 Spectrum of 1989r, showing ~~lots~~
CN, lots of C2, possible C3. 1pic of P/SW 1.

8086AN Sat 23/24/1900-0600 13-10-F / Mt Bigelow / 61"
Steve Larson / 1989r, 1989a, P/SW-1, P/Larus 1.
Unsuccessful search for P/Bradfield 2 1989c

8087E Sun 24/25/1900-2100 / 10-F / SM4 / ^{Miranda} / CN3 / 1W.
~~Kitt Peak~~

8088E Mon 25/26/1900-2000 ~~2100~~-F / ~~SM4~~ / ^{Miranda} / -
CN3 1W. 0h20^mW.

8089E 2130-2200 / 9-F / SM4 / Miranda - CN3 0h15^mW.

8090E Tues 26/27/1900 - 2100 / 10-F / SM4 / Miranda - /
CN3 1W.

8091M 0400-0430? / ~~10~~³-F / SM4 / windy / Miranda /
CN3 0h15^mW.

8092AN Wed 27/28/1900-0500 int / SMB, SM4 / Ophelia
Miranda - / CN3 Photo of Okayaki-L-R.
Search predawn, but of Vega region. Windy

8093E Fri 29/30/2000-0500 / Hidden Hollow, Ohio /
Minerva / Steve O'Meara, Peter Jelicke, Tom Glina

8094EM Sat 30/1 / 2000-0230 / Hidden Hollow / 3-F
31", look at 1989r OLR, possible look at
Nova Senti 1989. CN3 1W. / Steve, Peter, Tom &c

8095EM Oct 1/2 / 0100-0115 / 3-F / 3577A / water / Minerva.

8096M ~~Wed~~, Oct 4/5? / 0300-0330 / off E. Townships
Autoroute / -Minerva / CN3 0^h15^m W. Very windy
mostly cloudy.

8097M Sunday 8/9, Kollidre / 0200-0300 / near
St Edouard / Minerva - Peter Seducke / CN3
1^h E.

8098M Monday 9/10 / 0400-0545 / near St Edouard, then
near St Jacques / Minerva / Louis Bernstein /
CN3 1^h35^m E. 220 Bertioz, Apt 308
Ile des Soeurs, Que, H3E 1B3

8099E Thuro 12/13 / ~~04~~ 1930-2000 / Summit / 3-F / Minerva /
Maw, Ed, Lily Lubby / attempt at Okayaki-
Levy - Rudenko clouded out; good look at Moon.

8100E ~~Thurs 19/20~~ / Fri 13/14 / 1900-1930 / Gerry's house / Minerva /
Ed, Billy, Debbie, Michael, Daniel / search
for O-L-R - twilight + full moon. looked at
stars.

8101E ~~Saturday~~ Thursday 19/20 / 2100-2330 /
10-F / 3M4 / Miranda / -P CN3 1^h30^m W, E.

8102EM * Saturday 20/21/22 / 2100-0030 / 10-3-F / 3M4 /
Miranda / -P CN3 2^h30^m W.

8103EM Sunday 22/23 / 1900-0030 / 10-7-F / Mt
Bigelow / Steve Etc. Comet 1989r O-L-R. for 20 minutes
until comet set. Attempt to set up Schmidt
but too humid to open. Had to close 6l after
Yamaka + guiding camera tests.

8104AM 23/24/1900-0700/10-F/Mt Bigelow/6/ Steve Larson/
 New comet seen: 1989V Helin-Roman-Abe
 $M_1 = 13.5$: Coma 30" DC=2
 (Guided 30min on comet for very weak spec.
 CCD: OLR, 1989V, P/SW1 - "Ring-tailed snorter"

At start of evening,
 Guided on Comet Okazaki-Lvy-Rudenko - 2 10" spectra. Comet is very gassy. Also, solar elongation very low, so we needed to use all of the 20 mins available between twilight & comet getting too low. ϵ

Another new comet seen: 1989W Helin-Roman-Abe
 $M_1 = 14.5$: Coma 15" DC=5

i. Focus Film, 45^{s+w} , 47^w , 49^{st} , 50^{st} , 52^{st+v} , 54^{st+v} , 56^{st+w} , 58^{st+w} , 60^{st+w}
 (small dial betw. 4 and 5)

0317	Caster 1	20 min	(Focus 55)
0429	Caster 2	20 min	"

8105E ^{Tuesday} 24/25/1900-~~07~~ 2200/9-F/10-F/3M4/Miranda/-/
 CN3 1^hW.

8106E Wed 25/26/1900-2330/10-F/3M4/Miranda/-/
~~CN3 2^h30^mW~~ - CN3 1^hW.

8107E ^{Fri 28/29} Thurs 26/27/1900-~~0830~~-1955/10-f/I-104666,
 W of Wilcox | CN3 1^hW.

NOVEMBER OBSERVING ODYSSEY.

1

EM NIGHT 1

8128 AN Fri, 17 November / 1930-0300 / 2- F / KPNO / #2-36,
Munizva / - Michael Magee. Asteroid Geodesy
Glumpse of 1989 VA visually + in photometer.

NIGHT 2.

8129 AN Sat 18/19 / 1830-0645 / 10-7F / Kitt Peak National
Observatory / #2-36, Munizva / Michael Magee /
Asteroid Geodesy. Emphasis on
201 Penelope
354 Eleonora
568 Gae Cheruskia
1989 VA - partial curve +
visual observation.
43 Ariadne
plus some TV-test looks at 3673 Levy.
plus 3673 Levy (data).

Time	M value for comp star	M value for 3673
10:24	-11.850	-5.492
10:40	-11.851	-5.391
10:52	-11.8483	-5.362
11:11	-11.848	-5.497
11:30.52	-11.845	-5.459
11:54	-11.844	-5.380
12:17	-11.845	-5.412
12:30	-11.850	-5.311
12:43	-11.841	-5.278

8108M2 0340-0600/10-F/SM4/ ^{Minanda} ~~Aurora~~ / Ophelia / -
CN3F & UMi 0405 ~ 5m 0440
BUM. 0415 ~ 5m 0450
CN3 40m ~~W~~ E.

⁸¹⁰⁹ ~~8109~~ Sat 28/29/1845-1900/10-F/SM3/M ~~morwa~~ / -
CN3 0^h20^m W.

8110AN. Sunday 29/30/1800-0530/3-F/~~SM~~ Mt
Palomar / CN3G 20 pictures. / Gene +
Carolyn Shaemaker.

8111AM Mon 30/31/1800-0500/1-F/Mt Palomar / Gene + Carolyn^{Gene} / Jacin M.
18" Schmidt / CN3G - no pics.

8112AN Tues 31/1/1800-0500/3-F/Mt Palomar / 18" Schmidt /
Gene + Carolyn / CN3G - ~ 20 pics.

8113AN Wed 1/2 November / 1800-0600 / Palomar / 18" Schmidt /
Gene + Carolyn / CN3G - ~ 48 pics.

8114AN Thu 2/3 / 1800-0600 / Palomar / 18" Schmidt / Gene +
Carolyn / CN3G - ~ 40 pics.

8115AN Fri 3/4 / 1800-0600 / Palomar / 18" Schmidt / Gene +
Carolyn / CN3G / - ~ 48 pics.

8116AN Sat 4/5 / 1800-0600 / Palomar / 18" Schmidt / Gene +
Carolyn / CN3G / ~ 50 pics.

*8117ANS Sun 5/6 / 1800-0800 / Palomar / 18" Schmidt / G+C
until about 1900 / 12 pics: seed: 24 pics: CN43F.

1	0 53.2	+544	5-X1	22:24:30	8min	I
2	1 09.4	+4051	"	22:39:30	"	"
3	1 13.7	-507	"	22:55:00	"	"
4	0 53.2	+5.44	"	23:10:15	"	"
5	1 09.4	+4051	"	23:24:00	"	"
6	1 09.4	+4051	"	23:39:15	"	"
7	2 05.7 1 13.7	-0 02 =5 07	"	23:55:45	"	"
8	2 56.3	+426	6-XI	00:09:15	"	"
9	3 09.8	+1149	"	00:24:15	"	"
10	2 05.7	-0.02	"	00:38:30	"	"
11	2 56.3	+426	"	00:52:30	"	"
12	3 09.8	+1149	"	01:06:30	"	"
13	3 19.0	+109	"	01:26:35	"	"
14	3 13.1	+1855	"	01:42:15	"	"
15	3 53.9	+908	"	01:56:30	"	"
16	3 19.0	+109	"	02:10:15	"	"
17	3 13.1	+1855	"	02:25:00	"	"
18	3 53.9	+908	"	02:42:15	"	"
19	4 04.7	+1415	"	02:56:30	"	"
20	4 23.0	+926	"	03:11:45	"	"
21	5 19.6	+1053	"	03:25:30	"	"
22	4 04.7	+1415	"	03:40:30	"	"
23	4 23.0	+926	"	03:54:30	"	"
24	5 19.6	+1053	"	04:08:45	"	"

8118S Tue 7/8/1400-1430/7-F/Fiesta Island, San Diego, CA/
CNS SVen.

8119M2 0515-0530/10-F/ISM3/Munera/-/CN3 15^mE
 8120M Wed 8/9/ 0500-0530/10-F/ISM3/"-/CN3 25^mE
 8121M Thu 9/10/ 0430-0545/10-F/ISMB,F/Ophelia/-/
 CN3 F: Zeta UMa ~ 0510 5^m POLR
 UMa 0520 w/7,50b
 Zeta UMa 0530
 UMa 0540

8122M Fri Nov 10/11/ 0400-0600/ 10-Fm, then F after 0425 JMB/
Ophelia | Denebola ~0500 5m

1989r O-L-R 0510 3min (double)
0515 5 min (tracked)
0525 5 min ✓
0535 1 min ✓

Denebola 0545 3½ min

~~8127E~~

8123EM Mon Nov 13/14/ 2100-0300/ 7-Fm / SM2/ -1 polar
alignment of Ophelia's mount.

* 8124E Tues Nov 14/15/ 1900-2200 13-Fm / SM2,3/ 5m
Scotti/ Plaque for 1989r.

8125E Wed Nov 15/16/ 1900-2100/ 10-7-F / SM2/ Ophelia -
with her new mount! / -1 CN3F:

1	1900 MST	Oph	5 min
2	1910	Vega	
3	1920	Oph	
4	1930	Oph	
5	1940	: @ Tri	
6	1950	? - Tri	

8126E (should be after 8124), 1815-1830 ~ / 7-F / end of street)
Sunset + green flash. Thurs 9 Nov.

8127E Thurs 16/17/ 1930-2100/ 10-F / SM2/ Ophelia / -1 CN3F:

1	20:00	M31	5 min
2	20:10	: @ Tri	
3	20:20	? - Tri	
4	20:30	M31	
5	20:40	M45	
6	20:48	M45	

N ~ 10 arcmin

NIGHT 3

8130AN

This night began with clouds, but I did do:
CN3 Oh 15^mW.

E

^{NO}
• Nova Corvi
1931

← wrong star. Not NGC 31.

← Before dawn: field
of Nova Corvi (1931)
in the TV acquisition
camera of the 2-36".

↓
S

Sun Nov 19/20/1830-0645 / 7 1-10-3-0-7-F/
KPN0 / 2-36" plus Minerva / Michael Magee,
Gary Rosenbaum, plus → no one after 4.

At 3:45 I woke from a short nap & went to close down the telescope. As I approached it, the sky started to clear, but then started to drizzle! So, I closed up. On the way out it was clearing rapidly again. I went inside and turned on the photometer. As I reached for the telescope cover I fell off the platform. Although it was high off the floor, I hit the telescope, which broke the fall, so I was o.k., thank you very much, with a bruise only, after falling only 2 or 3 feet.

With that experience, I figured that the next hour's data had better be good - it was, except one time a cloud passed

over. I went outside, with Minerva and got an observation of Comet Okazaki-Levy-Rudenko. Then the cloud dissipated so I resumed observing, as follows:

43 Ariadne 5 points during the hour
3673 Levy 4 points " " "
—NO— Nova Corvi 1931 1 "
and standard stars.

So, it was a rather productive "hour" from 11:50 to 13:10 UT. I stopped at the session at 13:45. (0645 MST) I'm really glad I "saw" the nova for the first time (not visually, just through photometer + TV camera.)

NIGHT 4

8131AN Nov 20/21, Monday / 18:15 - 0430 10 -F/
Kitt Peak National Observatory 12-36" + Minerva/
CN3 10" W. in rain; clear low in west. / Stu
Weidenschilling.

Clouds + rain. The sky cleared by 2am, it was clear in the v and very nice; but the computer think hadn't said up could open the scopes. Stu + I discussed it, decided to plead ignorance, opened up and got over 1 1/2 hours of very fine data on Ariadne, Levy, + 563 Chruskva. We were phoned just after fog came in + we had

closed down. So we got some excellent +
legal data.

NIGHT 5

813REM

Nov 21/22/1800-0400/10-7F/ Palomar Mountain
Observatory / -18" Schmidt; Minerva used
at the house at very end of session / Gene + Carolyn
Shoemaker, Henry Holt.

CN36:

31 pictures:

search fields, plus
1989 UQ, 1989 VA, OB, 88 RF, PY, RA1, RJ,
PY, TU2 1989 VB.

Jarvised after driving since 11:15 (10:15 PST)
+ with 1/2 detour because of a wrong turn,
it took me 8:15m. Started observing
immediately with the others. Stopped 1/2 hr
after moonrise.

NIGHT 6

8133EM

Nov 22/23/1800-0400 13-F 1 Palomar Mountain
Observatory / 18" Schmidt, Minerva / Gene, Carolyn,
Henry / Pal. Asteroid + Comet Survey:

Visited Jean Mueller at 48". Sky
finally cleared enough for some poor images,
a bit usable, so we took one set of 8,
one of which was centered around the
Christmas tree in Monoceros region.
Quiet night. Looked at Moon, M42 with

Minerva - Also with Minerva.

CN3 0h 05m S.

CN3G: Spico

- NIGHT 7 -

8134 AM Nov 23/24 / NIGHT 7 / 10-3F / Palomar Mountain
Observatory / Gene + Carolyn Shoemaker and Henry
Holt / 18" Schmidt, Minerva / 1800 - 0530 /

Sky had been mostly clear with scattered
cirrus all afternoon with clearing toward west.

Then, when we started, the sky cleared enough
for some fields. As we began the sky cleared and
we had an inherently beautiful night. We took

49 pictures; Carolyn found comet 1989w on

one two of them and a glitch on another one
that could have been a comet but wasn't. A good

night. I also saw Comet Okazaki-Levy -

Rudenko at about $1/2^\circ$ W of moon, last crescent.

Then it got cloudy there; didn't clear until

moon was $\sim 1/2^\circ$ from comet. CN3G: 49 pictures

8135 AM Nov 24/25 - NIGHT 8 -

1830-0430 / 3-F / 3Ft. Palomar Mountain

Observatory / Gene + Carolyn Shoemaker and
Henry Holt / 18" Schmidt, Minerva / clear through

1 set of 6, then cloudy. Just before I left to
retrieve the hypered film from the 60 inch, it

started to clear. We started observing + did well
till fog came in at 2:15. We quit around 4.

31 pictures, including VA. CN3G: 31 pics.

for 1987HA, Trojans, 1989VB, etc.

NIGHT 9

25/26

8136EM 1750-0300 10-F 1 Palomar Mountain
Observatory / Gene and Carolyn Shoemaker and
Henry Holt / 18" Schmidt & Muerwa

CN3G: just occasional glimpses of stars.
Nothing opened; foggy with drizzle all
night. Jean Mueller visited for a while.

NIGHT 10

8137AN 26/27/1830-0500 1-~~10~~31-10-F / Palomar
Mountain Observatory / Gene and
Carolyn Shoemaker and Henry Holt /
18" Schmidt and Muerwa / after a visit with
Jean Mueller at 48, sky cleared rapidly.

CN3G: started before 21:00.

We took some pictures; then clouds
moved in. Then cleared up.

28 films total.

Comet O-L-R with Muerwa. Very
pretty, near star, tail $1\frac{1}{2}^\circ$. Through hy.

NIGHT 11.

8138AN 27/28, Monday / 1800-0615 / 10-3-F / Palomar
 Mountain Observatory / Gene & Carolyn Shoemaker and Henry Holt / 18" Schmidt & Murewa /

CN3G: 47 good pictures; night ended with a comet suspect - we took an extra picture. Then we found out it was an asteroid.

Comet Okayaki-Levy-Rudenko

28.50 $M_1 = 5.4$ naked eye

with Murewa Coma 4" DC=4

Tail 3° in PA 310°.

That's it for Palomar this time

But -

FMO	Nov 30.0	7	39.89	+25° 20.8'
(Amar)	Dec 2	7	44.03	+25° 23.7'
89-11-31-1.		4.0	47.92	V=16.7
NIGHT 12.		6.0	51.55	+25 26.7
		8.0	54.91	+25 29.8
				+25 33.2

8139AN 28/29 / Tuesday / 1800 PST-0645 MST / 10-F /
 Phase 1. 1800^{PST}-0045^{MST} - driving from Calif border to Mt Bigelow.

brief CN3 5" W. (at start of night)
 with Murewa

Phase 2. 0045 MST-0645 /

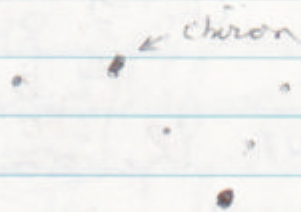
Mt Bigelow 61" + Murewa / Steve Larson /
 Chiron, P/Wtd 2

attempt to observe Chiron for evidence of coma starting at 01:45.

H Field of Chiron is very crowded
 with faint (and bright) Milky
 Way stars. We are making
 a series of 300 second exposures
 of "Chiron" here is comet. has report
 Only Mecht Belton (as far as I know)
 have reported coma on 2060 Chiron (= P/Kowal 3)

From 3:25:59 for 30 minutes
 and from 11:00:23, also for 30 min
 I guided a spectrum on
 Chiron by keeping it visually
 behind the slit.

New comet seen: 2060 Chiron



Then, several H₂O+ images of
 Comet Okazaki-Ledy-Rudenko
 1987c.

12:31 15min } I guided two
 and 12:50 15min } spectra
 of Comet O-L-R.

NIGHT 13.

8140AN 29/30/1830-0645 /10- F/Mt Bigelow/
61", Minerva / Steve Larson.

1989w Helin-Roman-Alu

1989u P/Kearns-Kwee field
(correct not identified)

→ 2x in 7x4 days

(Halley \Rightarrow 23x/7.4 days) Rotation solution
(?)

PRIMARY SOLAR ANALOGS

we did spectra on tonight

		RA (1986.0) Dec
Hyades #64	1+D 28099	4 25 50.4 +16 43 01
#106	2 9461	4 38 08.3 14 04 46
#142	30246	4 45 41.0 15 26 54

Another one we didn't observe is
16 Cygni B.

P/SW-1. very condensed (CCD)

1989w, P/H-R-A. (CCD) + P/Hovas 1 (CCD)

M₁, in red, H₂, + spectrum

9 guided: 9:33:00 } 30 min spectrum
10:08:55 } 60 min "
11:13:31 } 30 min "

View of Comet Okazaki-Levy-Rudenko
with 61" finder & Minerva. CCD images
in red & H₂O+.

8141M. Nov. 30/Dec 1 / 0300-0600 / 10-F / ^{SM4} SM2 / Optelia / Miranda /
 CN3F Finally, after much searching,
 a visual look at the Nova Corvi
 field. And a good look at
 O-L-R.

7.6 5.4 !
 5.2

1	0350r	5 min	T Max 400
2	0415r	"	"
7	0530r	"	"
2	0536r	"	"

8142M Dec 1/2 / 0345-0600 / 10-very F / SM2, 4 / Optelia, Miranda

3	443	5 min	T Max 400
CN3F 4	426	"	"
5	434	"	"
6	442	"	"
7	450	"	"
83	457	"	"
4	506	"	"
5	514	"	"
6	521	"	"
7	530	"	"

N Corvi 5:45 (13.5)
 and a farewell to comet O-L-R,
 quite probably. $M_i = 5.5$,
 $DC = 5'$, $CD = 3'$,
 Tail 1.5° , straight,
 in PA $\approx 300^\circ$.

8143M Dec 3/4 / 0545-0600 / 10-F / SM4 / Miranda 1-1
 CN3: 0^h5^mE. N Corvi (13.5).

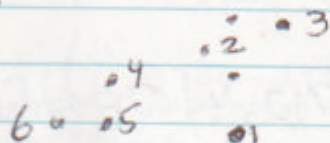
8144M 4/5 / 0430-0605 / 10-F / SM4, SM3 / Miranda 1-1
 CN3 1^h0^mE. N Corvi (13.5).

with Muneira

Comet Aarseth-Brewington

00:55 UT $M_1 = 5.8$ coma = 2.5' Tail 1°
 in PA 350°.

8145M 5/6 / 0315-0600 / 10-F / SM2 / A. Optelia 1-1
 CN3G:



1	3 48	5 min	TMax 100	4 51	5 min
2	3 56	"		5 00	"
3	4 04	"		5 08	3"
4	4 14	8 min		5 14	5 min
5	4 25	5 min		5 22	"
6	4 33			5 30	"
Mizar	4 42			N Corvifield 5:38	"

5.55 Nova Corvi (13.5) with SM4 / ~~Muneira~~ ^{Miranda}
~~CN3 15^mE.~~

8146M 6/7
 0250-0600 / 10-F/3M2,4 / Ophelia, Miranda /
 CN3F

	(7)	4:22	5min	TM 400	0!	2
	1	4:31				
	2	4:40			4	3
5 ^o	3	4:51				
6 ^o	5	4:59				
	Miran	5:07	1"			
	"	5:10	5"			

Nova Corvi 13.5 with Miranda
 CN3 15" E.

8147M 7/8
 0320-0600 / 10-F/3M2,4 / Ophelia, Miranda /
 CN3F

UMa	1	03:36	5min	TM 400	
	2	3:46	"		
	3	3:54	"		
	4	4:07	"		Red Film
	5	4:16	"		
	6	4:23	"		
	7	4:30	"		
Arct ₂	4	4:38	"		
	5	4:46	8min		
	6		5"		
Corvus	1	4:57	5"		
	2	5:05	"		
Cor Caroli		5:13	6"		
Spica		5:21	5"		
Corvus A		5:29	5"		

28 10/11

8148M ~~28~~ 0450-0530 / 3¹⁰-F / SM4 / Miranda / -1 CN3e:
Nova Corvi (13.2)

8149M Mon 11/12 / 0450-0530 / 3³⁰⁰?-F / SM4 / Miranda / CN3e
Nova Corvi (13.2)

8150M Tues 12/13 / 0400-0430 / 3-F / SM4 / Miranda /
CN3e Nova Corvi (13.2, test of "Daphne")

8151M Wed 13/14 / 0530-0600 / 3-F / SM4 / Miranda /
CN3e N Corvi (13.2)

8152~~M~~ Thu 14/15 1900-1950
Sat 16/17 / 0200-0600 / 3-F / SM4 / Miranda,
CN3 ^{Complete} Daphne - test photos.

8153M Fri 15/16 / 0300-0600 / int / SM4 / Daphne,
Miranda - test photos -
CN3e N Corvi (13.2)

8154MAN Sun 17/18 / 1900-0600 / 10-3-F / SM4, Daphne,
Miranda - test photos AGAIN, CN3E:
Nova Corvi (13.2)

8155AN Monday 18/19 / 1900-18:30-0600 / 10^{int}-F / SM4² / Miranda /
Observation of new comet George - I was less
than an hour away from it when Rolf
called to ask me to confirm it. N Corvi (13.2)

815' CN3 15^m.

8156AN Tues ~~Waffles~~ 12 gelatin. 19/20 / 19:00-0600 /
10²-F / SM4^B / Miranda / -1 1^h45^m CN3W.
Comet George. Daphne test - N Corvi (13.2)

through clouds but (13.2). Rather humid too.
Followed Panama invasion on radio &
later TV, clouds cleared in time for
Nova Crw obs.

8157~~AM~~EM Wed. 20/21 / 1900-0400 / 10-3-F / 5M4, B)
CN3 2^h W / Daphne ^{Cordelia} test with Wratten #12
gelatin filter. Still focus problem.
Solved astigmatism partly with iris. Comet
George fainter. N Corvi (13.2)

8158~~AM~~ Thurs 21/22 / 1900-0600 / 10-F / 5M4, B)
CN3 1^h W / Daphne test. # CN3e Nova Crw (

8159~~AM~~ Fri 22/23 / 1900-0600^{int} / 10-F / 5MB /
~~GN~~ Daphne, test shots. focus problems
Did moon map inside. CN3e. N Corvi (13.2)

8160~~AM~~EM Sat 23/24 / 1900-0415 / 3-F / 5MB, 5M4)
FINALLY a SUCCESSFUL PICTURE
WITH DAPHNE - well focused,
Spent several hours with it focus tests,
developing new glass backing plate
(thicker one). CN3e N Corvi (12.0.

1. Orion TM 100 20 min Dev 12 min T Max

*8161E Sun 24/25 / 1900-2330 / 3-F / 5MB / ^{CORDELIA} DAPHNE
^{two} focus pictures PLUS ^{TWO} SUCCESSFUL PICTURES !!
1. Orion ~2130 20 min T Max 100 dev 7 min D19
2. Pollux-Caster 20 min unhyg 1415 dev 5 min D19



Cordelia is even more appropriate - continues
Miranda-Ophelia tradition of Shakespeare characters
named for moons & asteroids

[name changed in September to Cordelia]

~~Depts~~ is a most appropriate name - the beautiful
camera ~~ATD~~. The mount took almost a
year to get ready, first for Ophelia, then for the
camera, and now the camera took flight for
over 2 weeks while I tried to get it to work properly.
Now that it has turned into a tree, so to
speak, may its laurel leaves always produce
good results.

8162M Sun 24/25/0300-0600/10-F/SM4/CN3 20ME
+CN3g 2 pics of N Crw-region
0555-0605, Somin 2415
N Crw-1931 (13.2)

8163M Mon 25/26/0300-0400/2-F/south walk, + N Crw (13.2)

8164M Tues 26/27/0530-0615/3-F/SM4/Miranda/
CN3 N Crw-1931 (13.2)

8165E Wed 27/28/1800-2250/1-F/MT Bigelow/61"/
Steve Larson/ —

8166EM Thu 28/29/2100-0300/2-F/JMB/
Dan + Donna + Elizabeth Wards
also, test of Daphne's new finder; works
fine. The Wards stayed til ~10:30pm.
Test done ~1a.m.

David, Thanks for the home tour and the
telescope deals. What beautiful skies and a great
observing set up! Please keep on inspiring us
with your great writing!
Dan Ward
plus Donna + Elizabeth.

8167E Fri 29/30/1830 - 0900⁰ | somewhat Cloudy Night
OBSERVED TWO SAKIMOTO CAMERA IN A MINI HOME
BUILT OBSERVATORY? A 16" REFLECTOR w/ ABOUT 6 FINDERS
SCOPE? BOUGHT A TRANSIT SCOPE FOR? THANK YOU DAVE
John Toppe

8168M2 0530 - 0615 / 10-F / 3M2.4 / Ophelia,
Miranda CN3 0h 35m E,
29h1 CN3F & GB 5min 2415

8169ME Sat 30/31/ 0530-0615 + 2000-2200 / 3-F /
3M2 / Ophelia / Gary Rosenbaum / Ophelia
repair

8170M2 0530-0615 / 10-F / 3M4 / Miranda /
CN3 0h 40m E. CN3e NC C13.2

8171S 0950-1155 / 10-F / 3M2 / Ophelia /
repair + check of drive + clutch system.

1990

8172EM UT Jan 1/2300 - 0430 MST/10-F/

Miranda, Ophelia / John Gressé

012031 TY Psc 12.8

31-1 12.13 J-Gem 5min TM 1900

31-2 12.25 J-Gem-1 1:46 31-10

12.34 422 419 5min (31-3)

• • 4

3

• 2

5

• 1

7

6

31-45 2 ^{11:55 ✓} 1:53 31-101

31-4 3 ^{12:51 ✓} 2:02 31-12

31-6 4 1:12 2:18 - 2nd film 1-1

31-7 5 1:19 2:26 1-2

31-8 6 1:29 2:32 1-3

31-9 7 1:37 2:40 3 1-4

CN3 25^m E. α Cru (13.2)

8173M θ Jan 2/0100-0600 110-F/SM2,4/Miranda,
Ophelia

2-1 CN3P, CN1: 428,49 TM 100 5min 0110

2-2 1) 1:24 # 2:28 (7min) 2-5

2-3 2) 1:33 (9min) 2:39 2-6

• • • 2-4 3) 1:46 2:47 2-7

3 2 Virgo cluster 2:55-10min 2-8

3:10 w Oph. B; 5min 2-9

2-9 3:20 R Crv 5min Oph C
 2-10 3:31 M42.
 2-11 3:45 428-19
 2-12 3:59 Vargo Group.

CN3 1h 30m E. at about 5:15, a-8
 football so from Leo southward. N Crv C13.2

8174M Jan 4 | 0230-0615 | 10-F/5M4/Miranda | CN3 25mE
 CN3e N Crv C13.2. walk earlier. Cold!

8175M Jan 5 | 0230-0600 | 10-F/3M2,4/A Ophelia, Miranda

Dipper
 9:23

	5-1	1	2 42	5min TM 100	4:25	6-1
		2	2 49		4:32	2
		3	3 256		4:40	3
		4	Cor Caroli 3:03		4:46	4
		5	6 3:11		4:55, again 4:58	5
		6	7 3:19		5:03	6
		7	8 3:30		5:10	7
		8	9 3:38		5:18	8
		9	10 3:45		5:25	9
		10	11 3:53		5:32	10
		11	12 4:00		5:41	11
		12	13 4:08		5:49	12

CN3e N Crv C13.2 CN3 5min

8176M Jan 8 / 0550-0650 / 10-F / JM4 / Miranda / ~~Ophelia~~ Miranda
CN3e N Crw (14.0 CN3, 20min E)

8177M Jan 9 / 0400-0415 / 10-F / JM4 / Miranda / Miranda /
CN3e N Crw (13.2)

8178M Jan 10 / 0430-0445 / 7-Fm / Miranda / CN3e N Crw (13.2)

8179M Jan 11 / 0230-0245 / 7-Fm / Miranda / CN3e N Crw (13.2)

8180M Jan 12 / 0300-0315 / 7-Fm / Miranda / CN3e N Crw (13.2)

8181M Jan 13 / 0300-0320 / 7-Fm / Miranda + walk / CN3e (12.5)

13 Jan 90 JW Christy
Charlene M. Christy

8182S [↑] Jan 13 / 0400-0500 / 10-F / JMB / Jim + Charlene
Christy / i look out back.

8182EM ^{sat/Sun 14/} F900-19 1830-0200 / 10-7F / KPNO / ^{Minerva} ~~Miranda~~
90-inch / - / CN3 1h45m W. Beautiful view of
Jupiter through 90-inch. Lovely features.

8184M2 0415-0445 / 7-F / JMF, 4 / Miranda, Minerva /
CN3e N Crw (13.2, rest of Minerva and new
Peracorn.

8185E 5 / ~~19~~ 1900-230 / 10-F / JM4 / Miranda / Minerva, Mir /
CN3 2h W.

- 8186M2 0300-0330/3-F/SM4/Miranda/
CN3e NGr C12.
- 8187M 16/ 0400-0415/3-F/SM4/Miranda/
CN3e NGr C12.
- 8188E 17/18/1830-2015/10-F/SM4/CN3 1^h W.w./Miranda
- 8189M2 0215-0230/103-F/SM4/CN3e/NGr-C12
- 8190E ^{Weed} 18/1830-2200/10-3/F - supposed to be raining!
10 SM4/Miranda/-1 CN3 1^h 15^m W.
- 8191M2 0415-0445/3-F/AFTER it rained/SM4/
CN3e NGr C13.2
- 8192M3 AGAIN!!! 0530-0550/^{3-Fm} because
Boulder got out/Miranda/-1 CN3 15^m E.
- 8193AN 23/24 (reverting to old system of dates I'm afraid)
1830-06:00/10-F/Mt Bigelow. 61/Steve.
Comet observing: ~~two~~ one new comet.
McKenzie-Russell $M_1 = 15.0$ $CD = 1'$
 $DC = 0$ NGr CCD
~18.5
- 8194AN 24/25/18:30-0500/10-F/Mt Bigelow/61/Steve/
comets. New comet Wild 19890a.
guided on it for spectrum. NGr-CCD ~18.5
- 8195M 25/26/0400-0600/10-F/SM4/Miranda/
NGr C14.0 CN1 40^m E.

8196M 26/27 Friday / 0445-0610 / 10-F / 3M4 / Miranda³
Munera CN3 1h 5m E. CN3e N Grv C14

8197M E 27/28, Sat / 04:1900-192200 / 3-F / TAAA site N of Benson /
Miranda / Star party - 1st view of Comet
Austin 1989c. CN3 1h W.

8198M2 0000-0030 / 3-F / 3M2 / Gt Gary Rosenbaum &
Terri Loppin.

8199M3 0500-0530 / 3-F / 3M4 / Miranda / - / CN3 5m E
CN3e N Grv C14.0.

8200M 28/29 / 10-F / 3M4 / Miranda / CN3 / e 1h,
N Grv C14.0.

8201M 29/30 / 10-F / 3M4 / Miranda / ^{Ophelia} CN3 115m WE.
N Grv C14.0

8202M Feb 2/3 / Miranda, Ophelia / 1800-180200-
0615 int / CN3F 1 7 12 2410

2
3

2 220

.4

3 228

5

4 237 452

6

5 246 ~~522~~

7

6 300 5.15

CN3 30m E

8203M 5/6, Mon / 02200-0030 / 3-f / La Comada / walk
with Steve

8204M 6/7 Tues 10530-0600 / 7-fm-10-f / 3M4 / CN3 30m E
N Grv C14.0

8205E Wed 7/8/1900-2100/3-F/3M2; 4/John Lewis Stage, photogr-

8206M Thurs Feb-8/9/ 0415-0450/3-7-F/clearing
after storm/ CN3e Now (12.0.

8207E Sun 10/11/12 13-F/3M2, 3/Ophelia, Miranda
3 Cnc 7:05 10min hyperad 24/5 CN3 10th W
5 7:19 " "
45 Cnc 7:53 " "

8208M2: 0500-0600/1-F/3M4/Miranda/ CN3e no luck.

8209M Wed/Thu 0000-0100/7-F/3M4/Mir- / CN3e (12.0

8210E Thu/Fri : 200 1900-2000 / 10-f/3M4/

CN3 1st W Miranda, Ophelia

CN3e Now (14.0

CN3F:

		8:41	10min	10	10 18
	.4	9:24	2les	5	10 32
3	'	9:33	2	5	10 40
.5	.2	9:39	3	5	10 47
'6	01	9:47	4	5	10 54
07		9:54	5	5	
		10:02	6	5	
		10:00	7	5	

8211 EM Fri/Sat 12030-0100/10-F/SM2, 4/seapion because
it is stormy in CA + I delayed leaving till
tomorrow. Then I got a headache but it
went away by 2100
CN3 1h 20m W.
CN3F

10min 859
10min 1001 10min 1110
5min 1126
Scale is 5m 1219 1328, 200
675 arcsec/mm. 5m 1226 1362 was 16.7
5min = 6.7 min exp on 18". asteroids
but sky is 9x brighter. found
2 1/2 mags less bright, or $M_B = 16$.

M Sun 18/19/ 10-F/Palomar, just cleared 1 Minerva/CN3e NCrV
CN3G: February. Minerva C12.0

8212AN Monday 19/20/ 1800-0530/10-F/Palomar/18" Schmidt/
G+C Shoemaker/-/CN3g. 404 Films.
CN3e NCrV C12.0

8213AN Tuesday 20/21/1800-0500/3-F/Palomar/
18" Schmidt and Minerva 1.

CN3g: only 36 films through
mostly very unbelievably thin
haze. Then there was
Minerva, a look CN3e NCrV C12.0
at 00:00.

Objects to try to find tonight.

.1, .2, .3 A4 .05 new FMO
BV
BA
BG

BG

21 507.7 + 47.52

22 504.5 + 48.11

BA

21 738.1 + 19.08

22 740.8 + 18.53

JP DA Amor 13-14-15

21 830.4 21 01

22 831.5 21 56

21 904.4 + 34.25

907.6 + 35.57

8214AN

Wed 21/22 Feb / 1800-0530 10-10^f 18" Schmidt, ^{Miranda} 1G+C/
Miranda / CN3e - N Gr (12.0)

CN3Gr, 32 films started at 11 pm when sky finally cleared.

8215EM. Thursday 22/23 Feb | 1800 to 0330 /
3 to 2, F1 Mt Palomar / CN3g. 11 films
including 1 CN3e of NGW (18.0).
Poor night, too much cirrus. G + C. Shoemaker

8216AN Friday ²³24/25 | 1800-0630 / 70-3-F /
JMB Mt Palomar / CN3g 60 films.
Miranda, Minerva CN3e NGW (12.0). G + C Shoemaker

8217M Sat 24/25 | 0030-0600 / 3-F / Mt Bigelow
61" + Minerva / Comet observing program.
CN3e (12.0, haze + cirrus)

8218S Monday, 26/27 | 1600-1700 / 3-F / JMB /
Miranda, Ophelia.

Carol Ford - Summer, wa.
Jury Ford - Summer, wa.

Al George Director, Pettinger-Guiley observatory
6103 132nd Street, E, Puyallup, wa
98373

George

Dave: What a pleasure to finally meet you - a true amateur astronomer in the first sense of the word. Will see you again next year.

Dave DeBruyn 2/27/90

Or see you again sooner. Thank you so kindly. Bill Sanders

8219
27 E ¹²⁸ 2 February 1990-220013-F/3MB/↑. M42, M1.
Quick session.

MARCH

8220M 1/2/87 | 0100-0500 | 10-F | 3M4 | Miranda | - | CN3 3^hE
CN3e 3^hE

8221M 4/5 | 0400-0530 | 3-F | 3M4 | Miranda | CN3 15^m
CN3e NGV C12.5

8222M 5/6 | 0430-0545 | 10-F | 3M4 | Miranda | - | CN3 40^mE
CN3e NGV C14

8223M 6/7 | 0430-0530 | 10-F | 3M4 | Miranda | - | CN3 45^mE
CN3e NGV C12.5

My file - "what a wonderful house this is"
(too bad it was cloudy and the seeing was poor! C'est la vie!)

Gerald Novitsky-Schieven Glad to be back. What a wonderful house this is

8224M 9/10/2130-0030/3-F/SM4, 2, 3/ Ophelia,
Miranda/ Alan Hale, Gerald Moriarty-Schiaven/
CN3e NCV C14.0.

8225M. ~~10/11~~ ^{11/12} ~~2200-0400~~ ⁰³⁵⁰⁻⁰⁵³⁰ / 3-F/SM4/3-F/CN3e NCV C12.0

8226M ~~11/12~~ 12/13/0200-0215/10-F/SM4/CN3e NCV
C14.0.

8227E 13/14/ 1930-2100 /3-F/SM4/ CN3 0^40m W.

8228E 14/15/1730-2300 /3-F/Saguaro National Monument
West/. John Stage - Town & Country - a wonderful
country experience - for Suzy + myself -
+ SM4 NCV duck + respect - our best and hopes
C13.2 You like the results of my specialty
John + Suzy Stage Suzy Stage
I know Int. Rd. Come visit
New Milford, May, 1999 when you are
(914) 980-1620 in the NY
area

8229M F. Thursday 15/16/ 000-0130~ /3-F/Don Parker's house/
16"/ CN3e NCV C12.0.

8230M Friday 16/17/ 0000-0200 / house near Don's house,
+ Don's house / 6" with interesting st almost-
stationary eyepiece mount, 16"/ Jeff
Beulah / CN3e NCV C12.0

8231A^E Sat 17/18 ~~1040~~ 2230-2245 / 7-F/ Aunt Beulah + Uncle
Jack's apt / general view. North Simon's house

8232A^E Mon 19/20/ ~~0100~~ ^{2100-2200 int} / 7-F/ Barry / general. / Barry.

8233M². 0100-0115 / 7-F/ Beulah's apt. / general view N.

8234M Tuesday March 20/21/0000-0015/13-F/3M4/Mi/-CN3e NGW-C14.0

8235M Wed 21/22/0410-0515/10-F/3M4/Micanda/CN3e NGW C12.0. ? object?

8236S Thurs 22/23/1100-1300/10-F/3M4/31/Micanda, Murena / attempt at Mars occul.

March 23. 27083 Nova Corvi 13.6

8237EM2[↑] CN3e finally succeeds - Nova is in outburst!

Called John Grise to arrange for C. Scovill to finish chart

(Bob Kennicutt 90" 318 4621-4032.

Dennis Zaritsky 201F 6535

Richard Wade 335 2752

Steve Howell

Called Gary Rosenbaum who arranged for spectra to be taken on 90" + 84".

Called Brian (before Gary) who alerted McNaught in S. hemisphere.

Called Janet Mattei's tape at AAVSO.

CN3 2^h35^m W, E.

8238EM23/24/2245-0100/10-F/3M4,3/1CN3e/Mi/Ophelia
Nova Corvi 14.5 at 2300.

CN3F NGW 12:04 5 min.

12:12 5 min.

Hypered 2415.

8239M2 0410-0515/13-F/3M4/Micanda.

CN3 0^h35^m.

8240E 25/26/1930-2245/E of Cula Band ^{and west.} /- /
darkening sky, then Corvus region.

8241EM

26/27 Sunday / 1800-0330 / 10-F /
Palomar 118" Schmidt. mostly cloudy 8 films
of Nova.

8242AN:

Report from Steve Howell on Nova Corvi

Spectra: 1) Diff between 1st 2nd night is striking
optical Temp (5500-9500A) in red

(23/24) On, 2nd night (24) red part dropped,
blue extremely steep

(22/23) 1st night - continuum slope
phenomenally steep. Extremely hot
outburst. H α in emission

23/24th H α twice as strong,
but stars still blue,
still hot, not as strong.

Emission lines largely from hot spot
In outburst - usually all this goes
away, but in Nova this

H α stayed visible in outburst.

H α Dropped 1 1/2 x in second to night.

Definitely a cv of some type
Presence of H α not unprecedented but
interesting. IUP may not have
been totally disrupted

Not a typical cv.

May be an X-ray source, maybe a low-mass
X-ray binary

Spectrum from Australia in blue also obtained
Session: 1830-0430 / 3-10-F / 31 Palomar 118" /
Carolyn + Gene Shoemaker / 44 films or so.

8243AN Thursday, April ¹⁹⁴⁹ 29/30/1900-0500/3-F/SMH Palomar
Mountain 18" Schmidt / Carolyn + Gene Shoemaker
Worked ok. 32 films.

8244AN Fri Mar 30/31/1900-0400/3-F/Palomar/18"
Schmidt / Carolyn + Gene Shoemaker/
Only 12 films taken through cloud.

lots of cloudy nights

8245AN Sat 31/1/1900-0545/3 then 7F, then 10-F/
18" Schmidt / Carolyn + Gene Shoemaker/
40 films taken, mostly 6-min exposures

8246M 1/2/190440-0500/10-F/SM4/ Murrel - / CN3 - 10"E

8247E 4/5/2000-2100/7-F/SM Clyde Tombaugh's
9' 16" reflector site / 9" / Clyde Tombaugh / # Jupiter,
Moon.

8248E 9/10/1900-1915/7-Fm/SMF.

8249AE 10/11/1900-~~21~~15/7-Fm/SMF, SM2/ Ophelia 1-1 ¹⁹⁴⁰⁻¹⁹⁴⁵ 19:50 Capella
20:00

8250E 11/12/1945-2115/10-F/SM4/ Miranda / - / CN3 45mW

8251EM 17/18/1900-0100/10-F/18" / G+C.S. + Japanese camera

8252SE 18/19+9 Ophelia C's scale: 686 arcsec/mm.

4pm - 0000/0-F/
Palomar.

f = 30 cm,

≈ 688 arcsec/mm.

slightly under 1.5,
about f/1.48.

Threshold mag. should be 2.4 mags brighter than
18" or $M_B = 16$. Field is 10.5° .

each $2\frac{1}{4}$ film covers 86.6°
or 52° with overlap.

8253AN 19/20/1900-0400/3-F^{sf. days}
JIT Palomar / G+C Shoemaker / CN3G, 26 Films.
TV Grawat first.

8254EM 20/21/1930-0200/0-10-F/ Palomar / G+C Shoemaker /
2 films.

*8255AN 21/22/2000-0530/10-F/ FLEET PLANETARIUM.

A few telescopes set up by the fountain. 10
minutes with Sean Mueller, Dennis Mamana,
Mariska Emory, + others. Then Sean + I
drove to Palomar:

PALDMAR / C. Shoemaker / -18"
Schmidt. Carolyn had done 6, I helped
with 34 more, incl. Austin.
Beautiful night!

8256EM 22/23/2000-0100/0-F/ Palomar. Nothing.

8257M 25/26/0130-0600 110-F/3MB, 3M3, 3M4/

Comet Auphin viewing.
Cozy Warren - KVOA-TV 4
Ken Hosto - KVOA-TV
Rodney R. D. Austin
Mervyn Thomas
Tim Hunter

8258M 26/27/0200-0220/10-9-F/3M4 / Miranda / CN3 15ME.

8259EM 27/28/2230-0140/3-F/Wildacres, N. Carolina / -AT SOUTHERN
STAR conference.

8260M May 23 | 0400-0500 | 9-8-F | St Jacques | Carl Jorgensen /
 Carl Jorgensen David and I
 saw comet dustin at about 6th magnitude
 at about four fifteen in the morning
 on April May 3, 1990. I was disappointed
 because of the prediction of a comet of
 a lower magnitude.

8261E May 11/12 | 1945-2130 | 10-7-F | J M 4 | Miranda /
 CN3 1^h. couldn't find 1990B. CN3e N Gw
 (14.0)

8262E 12/13 | 1945-2140 | 3-F | J M 4 | Miranda - | EA: general view.
 CN3e N G V (14.0)

8263AN 13/14 | 1900-0550 | 10-F | M + Bigelow | 61" | Steve
 Larson | Comet Gernis - Kiuchi - Nakamura 1990B.
 CCD, AND Visual $M_1 = 13.8$; $CD = 1.5'$ $DC = 2$
 p/w/4, CCD. Austin w/ CCD + through
 finder.

8264AN 14/15 | 1900-0530. | 10-F. - 7-F
 A. J M 4 / Miranda. CN3 1^h W.
 Ophelia CN3e ~~2230~~ 2230 5 min 2415 1 @ M13 1
 2240 " 2 3 2
 2300 3
 2310 4
 2320 5

B. 61" M + Bigelow with Steve Larson)
 Spectra of Comet Austin,
 He had cloudy sky earlier.

8265 ANS 15/16/2000 - 06:00 / 10-F / 1

A. JM4/Miranda 15m CN3 W, E.
Ophelia CN3e

Time	Length	Film	Region
~2200	5min	245	1
~2210	"	"	2
~2220	"	"	3
~2230	"	"	4
~2235	"	"	5

B. 61" at Bigelow / Steve Larson / Spectra
and images of Comet Austin.

Moon; Beautiful high resolution
images of

Treisnecker, Treisnecker + rilles
Huygens and valley-crater chain
Hipparchus

8266 M 16/17/0200-0400 / Mt Bigelow / 1-F / 61" /
Steve

8267 AN Thursday 17/18/1930-0500 / 3-F / JM4 /
Mt Bigelow / ~~Miranda~~ Miranda / CN3 /

A. Minerva - B 1400m W.

B. 61" with Steve and reporters and 2K chip.

8268 M Fri 18/19/19 0140-0600 / 3-F / 61" /
Steve / Comet Austin et. al. ~~traps~~ reporters
and our old system - nice session.

8269E May 19/20 | 2130-2200 ~ / 10-3-F / Sunspace Ranch /
Walter & Miriam Houston / - / ~~CA~~ general look

~~8270M~~ 8270M 19/20/21 | 0230-0500 / 10-F / JM4 / Miranda

CN3 0^h40^mE. Discovered my sixth comet
at (1950) RA 23.54.3 and +27.5°. $M_1 = 9.6$

8271E Sunday 20/21 | 2200-2215^{MDT} / 7-F / Clyde's house /
Clyde Tomblough. Pointing out where Corvus
CV is.

8272M 0400-0545 CDT / 10+-F / Texas Star
Party. Confirmed Comet 1990c.
23 55 + 27.7°

8273AN Monday 21/22 | 3-F / Texas Star Party.

CN3 2^h W with Menerva,
then clouds.

8274EM Tues 22/23 | 3-F / Texas Star party.
Houston: Surprise birthday party, clouds.

8275EM Wed 23/24 | 3-F / Texas Star Party, still
lots of clouds. Brian Maroden arrives.

8276AN Thu 24/25 | 3-F / Texas Star Party. 2 hr nap
CN3e in middle of night. CN3 1^h45^mE with Amelia
• NW Goldberg's 13-inch reflector and new 32mm eyepiece

- 8277AE. Fri 25/26 May / 2200-2300 / 9-10-F / Riverside Telescope
Makers Conference: John Bortle, Charles Morris,
~~Clyde Tombaugh, Alan Hale~~
Brian Marsden.
- 8278M2 Fri ^{25/} ~~26/~~ 26/27 / 0300-0400 / 9-F / Riverside / John Bortle,
Steve O'Meara, Charles Morris. 18", Minerva.
Clouds.
- 8279M Saturday 26/27 / 0300-0400 / 9-F / Riverside /
John Bortle, Steve O'Meara, Charles Morris, Alan
Hale. Comet Levy 1990c. Also a new comet
for me: P/Schwarzschild-Wachmann-3.
8", Minerva.
- 8280M Monday 28/29 / 0000-0100 / 7-F / Clyde's house
Las Cruces, N.M. / Clyde Tombaugh and Patsy /
Comet Austin, M II
- 8281M Tuesday, 29/30 / 0300-0350 / 10-F / JMY /
~~Miranda~~ Miranda / CN3 15^mE.
- 8282M Wednesday 30/31 / 0000-0400 / 10-F / JMY, 3/
Ophelia, Miranda / Some pics with Yashica
mounted on Ophelia / ~~to~~ CN3 1^h 20^mE.
- 8283M Thursday 31/1 / 2245-0400 / -3-F / Kitt Peak
National Obs / -1 Asteroid Geodesy: Sylvia
and 329 Svea. Observed alone, got
partial lightcurves on these 2 asteroids,
JUNE
- 8284AM Fri 12 / 1900-0600 / 10-F / KPNO / 36 / M. Magee /
Asteroid Geodesy. Now 13.5 w 36.

*8285AN 2/3 June 1830-0445 (10-7-F(m) /
Part I: Dr. Ed Vega's observatory, TAAA:
Dedication of the George Van
Biesbroeck Telescope at M with
Tim Hunter, Tom Gehrels, and David
Crawford.

Part II: KPNO 2-36: Asteroid Geodesy.
41 Daphne 334 Chicago
1045 J Minerva: CN3 $0^h 40^m E$. $1990c M_1 = 8.9$
DC = 5' DE = 4

8286AN 3/4 June 1830-0445 / 7-Fm / KPNO 2-36.

Asteroid Geodesy.

329 Svea

181 Eucharis

1990 KA

88 Thule

10:55 Comet Levy. $M_1 = 9.0$ through Minerva $DC = 5'$ $DC = 5'$
 $M_2 = \sim 12.0$ through 36" camera
 $\sim 6"$ across

WWCeti outburst.

8287M 4/5 June 1830-0415 / 10-F / 5M4, F / Miranda
CN3 $0^h 35^m E$.

0330 $M_1 = 8.8$ Camera = 5' DC = 4 w/ Miranda

0405 $M_1 = 8.6$ with 7x50 binoculars
also seen with Minerva

8288E Sunday June 10/11 1990 2130/10-7-F/
JM4/Miranda / CN3 35th W. CN3e Nov (13.2)

* 8289E Monday 11/12/2015-2230/10-3-F/JM3, 4/
Miranda, Minerva / CN3e Nov (13.2)
CN3 with Minerva + Miranda 1^h W, SW.
During CN3e, Walter Haas called to say
that I am this year's recipient of the ALPO
Walter Haas Award.

8290E Tuesday 12/13/2150-2300/ CN3F with
Ophelia + Yashica 2251 10min & Lyr.

8291E Wed 13/14/2030-2300/ CN3-1^h W. w Minerva
10:35 10min Yashica & Lyr
10:50 5" " & Lyr.

8292E Fri 15/16/2100-2200/ - / general observing

8293AN Sat 16/17/2000-0300/3-F/ Palomar 18", pinax
R Thacker, Henry Holt. CN3G 134
pictures. Severe focus problem.
Comet Levy 1990 c: 8x35 binocs, and guidescope

8294AN 17/18/2030-0400/10-F/ Palomar 18", smaller scope /
H. Holt. CN3G ~20 films. focus problem
1st half of night. Scanned some films rest afternoon.

8295AN 18/19/2030/0500/ 10-F/ Palomar 18", small scope /
H. Holt / CN3G 21 films. focus problem 1st half.

8296AN 19/20/2030-0415/ 10-F Palomar 18", small scope /
21 films again - Focus problem 1st & third of night

1990MB: June 20, 26 16 51 35 -2 32 05 70+12?
 Discovery → 22.2 16 49 08 -1 35 30.4 68+12 (69+9)
 N 23.21 16 47.57 -1 07 54.2 70+12
 David L. took all these pics and made discovery on 22.2 films.

8297AN June 20/21 2015-0500 10-F / Palomar 118" /
 H. Holt / CN3G. ~~Discovery of asteroid.~~

1645 E. 16302 +201 1645 W. MIXING-CHEMICALS
 Recipe → 1649 08 Field center 1630 }
 1649 08 -1 35 16 42.4 }
 * 407 }
 5min
 30 sec
 69+9 is very likely discovery field.
 probably on field 69+9 both films taken by D

Rapid fixer. 4 1/2 min
 40 oz Solution A, then 4 lit. of water
 then 4.38 oz " B

Photoflo fill container with water, + (at least) 1 cap solution

hypo-elim. 1 liter of hypo eliminator and 1 1/2 min
 4 liters water. w/agitation

8298AN 21/22 / 2015-0500 / 10-F / Palomar / H. Holt / CN3G-
~~Observation of (photo. obs.) asteroid~~
 Next day discovered an asteroid on films we took
 16 49 08 -1 35 30.4 area 68+12 or 69+9 guided by me
 1950.0

8299AN 22/23 / 2015-0600 / 10-F / Palomar / 18" / H. Holt / CN3G.
 Photo of object I found. 1990MB
 70+12 16 47.57 -1 07 54.2
 1950.0

1990MB

Circular 5045 announces discovery
5047 " me as discoverer
Golo Helin has positions on 26.26.

8300AN. 25/26 June. | 2000-0400 | 10-3-F | JNT. Bigelow.

Comets: Comet Levy spectra & imaging.

8301AN. 26/27 2000-0400 | 1-2-F | JNT Bigelow.

8302EM. → Sandy Sheehy - Land & Country magazine

4425 McKinney writes - How many
Houston, TX 77023 generations of desert
713/921-3646 creatures have looked
up and marvelled?

2000-0200 | 3-F | JMB4 | Sandy Sheehy,
Jim Scotti. Comet 1990c.

8303S. July 1/2/75 1800-1830 | 3-F | JMB.

Charles M. Christy Jim Christy
1720 W. Nina Pkwy
Tucson Az. 85704

8304E. 2/3 | 1830-2300 | 3-F | JMB3 |

8305M2 0300-0400 | 3-F | JMB4. Comet Levy

~~Richard N. Johnson~~ Raymond Johnson
1990c
Very weird weather conditions,
but it worked out fine. TODAY 3 JULY 1990 I SAW
3 GALAXY'S AND COMMET LEVY!

8306M. ? 4/5 | 1800-0200-0400 | 10-F | JMB4 | Miranda
Miranda | - | CN3 1^h 30^m W. E.

8307E. July 5/6 / 2000-2100 / ~~10~~¹-F / JM3.

Patricia Trueblood

July 5, 1990

cloudy! but the
conversation was
wonderful!

Mark Trueblood - great observatory; a real
pleasure to meet a celebrity in astronomy.
Keep up the good work and long hours.

8308S July 7 / 1800-1830 ~ / 3-F / Clyde Tombaugh's house
C+P. Tombaugh and R. Shaffer.

8309E 8/10/11 / ~~12~~ 1930-2030 / ~~10~~ 1-F / Tim Hunter's
Grasslands Observatory. 124" / Tim B. H.)

8310M. 12/13 / 0400-0420 / 1-F / South walk.

8311M 13/14 / 0310-0400 / 3-F / JM4 / Miranda - /
CN3 On 0.5m E. ~~EN~~ View of comet
1990c through bright gibbous moon $< 20^\circ$
away and heavy patchy cirrus. Comet
was easy to spot, with tail + everything.

8312E 16/17 July / 2000-2300 / 10-F / JM4, 3 /
CN3 2 DW. Comet Tsuchiya-Kiuchi
Jul 2 17.21 $M_1 = 8.6$ DC=2 CD=10
Slight sunward fan.

8313M2 0000-0100/10-F1JM3/-1-1.

8314M3 0315-0400/10-F1JM4/Miranda/-1
CN3 0h 30m.

8315M Jul 17/18/10³-F1JM4/Miranda/Miranda/
-1 CN3 0h 20m

8316M July 20 19/20/2000-2100/1-F1 Az.
Football Stadium/ Michael McGee,
Doug Flurry, security guard / test
site for Sept 7. comet night.

8317.EM Jul 20/21/2200-0200 int / Az-Cal.
Some meteors. one bright Delta
Equinox ~ 2300. $M_1 - M_2 = -3$.

8318SE Jul 21/22/1930-02240/10-F1
San Andreas Fault near
Miranda
Steve
Eclipse began ~ 8:05:30, sunset ~ 3 minutes
later. Marvellous tension - will we see it?
Moon gate cut quite a way in in 3mins.
Then CN3 1h W,
View of Comet 1990c.

8319M2 0030-0120/10-F/ 1 Minerva/
Steve / Comet Levy probable naked
eye sighting. In Minerva, $M_1 = \sim$
7.0; fail 30.

8320M 22/23/1900 0310-0330/10-f/ near Palomar/
Minerva / Comet 1990c with naked eye
and Minerva.

8321AN 23/24 / 2000-0500/10-f/ Palomar/ 18", CN3G
Minerva / Comet 1990c with naked eye.
Successful, pleasant night.
HE + HR Holt.

8322AN 24/25 / 2000-0500/10-f/ Palomar/ 18",
Minerva / Comet 1990c. CN3G 37 films.
HE + HR Holt, Jean + Cindy.

8323AN 25/26, Wed / 2000-0515/10-f/ Palomar/ 18"/
Comet 1990c with naked eye + binoculars/
CN3G over 35 films. HE + HR
Holt.

8324EM 27/28, Fri / 2100-0230/10-3-f/ STELLAFANE
Many telescopes + Stellafane people/
~~CN3G~~ Look at Comet Levy 1990c through!
several scopes + CCD. A few observers
saw it naked eye.

8325EM. Saturday, July 28/29/10³-F/STELLAFANE/
Many people. This session began at 2100
as the sky started to darken. I was the
keynote speaker, and gave my talk about
comet hunting perspectives and Parker
to about 2300 people and one comet
which was in the sky to the east at the
time of the talk. Afterward the
sky got better and we were treated to a
spectacular aurora and it was
very wonderful. CN3 with Peter's
8-inch: 15^m E through clouds.
Other participants included Peter
Jeducke and Tom Collins.

8326M Sunday July 29/30/13-F/St Jacques
site / Minerva, 8" / Peter / CN3 1^h E,
Comet Levy.

8327EM Monday, July 30/31/23 18-05:00 / 13-F/
Carl's house then St. Jacques site / Carl /
Comet Levy. then CN3 0^h 40^m E.

8328EM Wednesday August 1/2 / 2200-0200 / 4-F/
RASC / 14" / Constantine, Louie, others /
Comet Levy 1990c, with tail.

8329EP Thurs 2/3 / 2130-2140 / 4-F / 3577 Awater.
Mother / Minerva. general look.

8330M2 0300-0320 / 4-F / 3577 / Minerva / Comet Levy.

8331SE Sunday, Aug 5 / 1700-1930 / Centre d'Observation
Recherche de Mandeville, with several
very nice observatories / Marc Jobin and
others. O-F.

*8332M. Tuesday 7 August / 0100-0245 / 3-F /
LCP-818-LW (+ van)
plus 3577 Atwater
plus Westmount park

7x35 Binoculars. From first 2 sites
a good view of Comet Levy 1990c.
Saw Comet also through Minerva
at 3577 atwater.

8333E Wed 8 Aug / 2200-2330 / 3-F / RASC /
14" / Comet Levy 1990c.

Very strongly
condensed inner coma, DC = 9.

8334EP Thu 9 Aug / 2200-2205 / Grosvenor Ave /
Maw, Salomons - clouds.

*8335EM Sat 11 Aug. / 2000 to 0230 / 3-F / GREEN
ACRES / AGAA members. (several telescopes)
Also Ms. Comet! 2 perseids. (sky was
not good.)

*+ 8336 E Tues, Aug 14/2130-2230/7-F/Gerry's
house / Minerva, Mother, Gerry, Audrey,
Billy, Debbie^{+Hill}, Michael + Daniel all
got a good look at Comet Levy.

*+ 8337 M2 0030-0115/9½-F/ St. Jacques site /
Minerva / Walter Buchigiani from the
Gazette / Beautiful, naked eye view of
Comet Levy. I can't believe how easy it
was to see with the naked eye. First I
saw it from the car window as we got
off at St Jacques exit!

*+ 8338 M Thursday, Aug 16/17/ 0030-0200/ 7-F/
Richard's balcony, Toronto / Richard,
Jeff, Marcy, Linda / 6" reflector /
View of Comet Levy. Everyone got to
see it quite well!

*+ 8339 EM Fri Aug 17/18/ ~~0030~~ 2000-0200/
3-F/STARFEST. Comet Levy. It was
clear enough to see Comet Levy naked eye.
"It must be an indescribable thrill, to be able
to look at the sky without a telescope or
binoculars and see your comet. It is
the pinnacle of a career that most people
would never even dream of."

8340 EM Sat Aug 18/19/ 2200-0200/1-3-1-F/
Starfest. Brief view of 1990c.

8341M Sunday 19/20 Aug / 21:00 to 02:30 /
3-F / Peter Sedick's new home /
POLARIS through skylight. - his house
pk-aligned! Also Comet Levy outside.

8342M Mon 20/21 Aug / 00:00 - 02:00 / 3-7-F
A San Diego Beach / Jean! / Comet Levy
first from car windshield on I-8,
then from beach, $M1 = 3.7$

11:00 UT $M1 = 3.4$ Coma $\sim 40'$
Tail 3° broad fan towards NE.

8343M2 4:00-5:00 / 10-F / Palomar / Minerva /
CN3 $0^h 30^m$ E. Comet Levy above.

8344AN Tues 21/22 / 1900-0500 PDT / 18" + Minerva /
Very nice view of Comet Levy. I could look
up from eyepiece while guiding and
see it shining at me through the slit in
the dome. Michelle Olmstead is our observing
assistant this run.

8345AN Wed 22/23 / 1900-0500 / 18" + Minerva /
Again Comet Levy is very bright
at 9 UT $M1 = 3.1$.

82
9 Found an interesting object on field 94-6,
centered at $22^h 58^m - 19^\circ 36'$, taken
this night.

8346AN Thu 23/24/Aug / 1900-0530 / 10-F /
Palomar / 18" + Minerva /
CN3 30" w/Minerva before dawn.

8347AN Fri 24/25 / 1900-0600 / 3(unf) / Palomar / 18" +
Minerva / 27 films plus two more that Hank
took after it clouded over, plus 2 they took
after I told them it was clearing.
Comet Levy finally has a noticeable tail
and is looking very pretty.

8348AN Sat 25/26 / 1915-0600 / 10(unf) / Palomar / 18" +
Minerva / films. Lots of observing Comet Levy.
It shines right through the slit in the dome
when I'm guiding an exposure. Night
ended badly however. Aside from Comet Levy
and Jean Mueller, this run is the worst I have
ever been on.

*8349AN Sun 26/27 / 19:00-06:00 / 10-F / Palomar
PLUS Lake George via telephone / 18" + Minerva
at Palomar. Larry's telescope at Lake
George. Mother, Larry, Joyce, Wendy +
David, Robby and Ali all saw Comet
Levy both with telescope and unaided eye.
Mau commented on the fan-shaped tail.
This is the first comet that all my family -
including all nephews and nieces - have
seen. been able to see.

*8350AN ¹⁹³⁰⁻ 27/28 August, Monday / 0600-10-F / Palomar / 18" + Mercurio / C.N3g.
Comet Levy's dramatic changes over the 3 nights it appeared on tonight, as well as its ~~to~~ ^{to} the her changes from night to night, have been a marvel to study and a joy to observe.

8351M 28/29 Aug, Tues / ~~#~~ 0000-0200 / SDB - on way home. Et look at Comet Levy with naked eye.

8352M 29/30 / 0300-0400 / general look - comet behind clouds.

8353A 2/3 Sept / 0400-0415 / ~~#~~ 3-F / Miranda / general view.

^{FK} 8354E. 3/4 September. / 2000-2230 / 2-F / JM4 / Miranda / Andy Rudeen / Fabulous performance by Comet Levy moving across the stars in MR. Sometimes we could even watch the comet move in "real time" as it passed very close to stars. Beautiful show.

8355E. 6/7, Thurs. / 2100-2200 / 3-F / Gary Rosenbaum's apartment / binoculars / Gary + a young person from Denmark. / ~~ET~~ Comet Levy, Saturn, Moon,

*8356AE Fri Sept 7/8. / 1900-2230 / 7-F-3 / Roof
gallery of Arizona Stadium / "Comet Hunters"
4th graders and Flandrau Planetarium -
- First Light -
For
CORDELIA

and

OBSERVATION of
COMET LEVY

Cordelia - the Celestron int. plus the (former)
Edmund Voyager telescope and my camera -
tracked the comet very well all evening.
Took 3 po exposures of the comet.

8357E Sat 8/9/1900-2200 / 8-F / Clyde's house /
10" reflector / Patsy, + neighbors / Moon and
Comet Levy, Saturn, M22, M4.

8358EM2 8/9/0100-0130~ / 8-F / Clyde's house /
10" reflector / Moon. Littrow valley.

8359M 9/10/ 0430-0510 / 7-F / JMB / Miranda / - /
CN3 10" E.

8360E 10/11/ 1930-2030 / 8-F / 8 Green Valley / Sonora

Astronomical Society 18" Celestron, refractor,
binoculars / nice view of Comet Levy as
part of my lecture.

8361E2 2140-2330 / 10-F / JM4 / Miranda / - /
CN3 1h 10m W.

8362MB 0430-0510 / 7-Fm / JM4 / Miranda / - /
CN3 0h 20m E.

8363A 11/12 Sept / @ 1900-0000 110-F / JM2,4 /
Ophelia, Miranda.

CN3F. hypered 2415.

C Time Object.

no images. , no comet hunting

8364M2 @ 0400-0500 / 10-F / JM4 /
Miranda 0h 30m E.

8365 E 12/13 Sept. / 1900-2100 / 70-3-F /
JM3, Judy & Roy's house /
CN3F. Beautiful images of trees
blocking out all starlight
look at Comet Levy through
Minerwa with Roy & Judy.

8366M2 0300-0600 / 7-F / SM24 / Ophelia,
Miranda / photo test revealed 'tree'
problem - partial coverage by trees,
CN3 0430mE

* 8367E 13/14/1900-2100 / 3-O-F / SM2 /
Ophelia / CN3F

First groundout, finder was
way off. Adjusted finder. Just
after guide star was chosen, sky
clouded. I left scope pointed
because it is in a very odd position
& it is necessary to crawl under it
to repoint it. Guided by standing on
a chair outside building, guide scope
almost touching wall.

Then it started to drizzle, then
light rain. I tried to cover the
guiding eyepiece & paddle; telescope
of course was covered. Then
it stopped. Sky at comet cleared
just as comet was going behind trees.
I got 2 exposures

~8	~7:50	2 min	hypered 2415
	~8:00	2 min	↓ poor guiding

Then sky guided clouded over again
& rained heavily throughout the SE
Vesta area.

8368M2 13/14 Sept / 0415-0500 / ~~10~~³-F / JM4 /
Miranda / - CN3 0^h30^mE.

8369M 14/15 Sept, Sept / 0400-0515 / 10-F / JM4 /
Miranda / - / CN3 0^h30^m35^sE, one
suspect.

8370AN Sun, 15/16 Sept / 1900-0400 / 3-1-F / Mt Bigelow /
61" / Steve Larson / two exposures of P/Wolf -
Harrington 1990e. Sky clouded afterwards.

8371AN Sun 16/17 Sept / 1900-0600 / 10-F / Mt Bigelow /
61" / Steve, who was kind enough to grant me
time to observe Comet P/Wolf - Harrington
through the 61" telescope eyepiece. /

Comet Levy 1990c. in red and H2O+ (620)
→ Comet P/Wolf - Harrington -
visual observation
Coma diameter = 0.5 arcminutes.
D.C. = 2 Coma elongated.
M₁ = 14.0:

Gee, it sure looked pretty.

Comet P/SW-1 with marvelous
coma in CCD:



We also saw P/Kearns-Kwee (CCD only)
 and P/Encke ("")
 and P/Honda-Mikos-Podjursakova
 (CCD only). Worked out very well. J
 had suggested we include it AND it was
 the a very fine comet with ion
 structure etc in the tail, changing
 over just a few minutes.

With Ektachrome 64
 1/4 sec at F/5.6 or F/8.

8372E. Mon 17/18/1900-2100/1-F-0/JM3/Cordelia

8373M2 0400-0500/3-F/JM4/Miranda/
 CN3 0^h35^m.

8374AN 18/19/1900-0500/10-F/JM4/

Testing new camera on Cordelia

90-19-11990c	~ 2005	5m	Clyde's camera TMax 100
90-9-19-2'	~ 2035	5m	new f/3 (eff) hyp. 2415
3		20min	M11 region
4	~ 0100	1min	test of M42, Miranda
5		2 1/2 "	

8375E 19/20/1900-2200/3-F/JM3/Cordelia
 at F/6:

90-9-20-1	19:42	Comet Levy	5 12min
	20-220:04	"	5min clouds
	20-3		M8 region

90-9-21-1 19:25 Cordelia 4min Comet Levy
 21-2 19:30 15min
 21-3 19:47 2min
 21-4 19:50 1 1/2 min - clouds
~~19:55~~

2415
 21-5 21:14 Ophelia M3/region ← 5min → 0237
 21-6 21:25 ~~And~~ 8 And ← " 21-9 → 0245
 21-7 21:42 ~~And~~ α And ← 17min²¹⁻¹⁰ 0256
 restart 23:11 finished after clouds, then 4min → 5min

CN3 0h35m E.
 @ 2:3

8376EM 20/21 Thursday 1900-2400^{05 unit 3} / 10-F / JM4,3 /
 Pictures of Comet Levy. CN3 0h30m E

8377E 21/22 Fri / 1900-2300 / 3-1-f / Empire
 Ranch / Cordelia, Minerva / All-Arizona
 Star Party Wonderful, but only
 2 pics of Comet Levy.

8378AN 22/23 Sat / 1900-2530 / 3-f / Empire
 Ranch / Cordelia, Minerva, CCD /
 All-Arizona Star Party.
 CN3 / h.w.
 Pics of Comet Levy
 Then, at home, JM4 / CN3 / h.E.
 1 suspect.

8379E. Battling heavy winds from the southeast we managed to photograph Comet Levy 1990C - How exciting. I even saw it before it hid behind the clouds and the horizon. A great adventure - Thankyou, David

Liz

23/24, Sunday / 1908 - 2300 / 10-F but very strong. SE wind. Liz helped by blocking wind from hitting Cordelia / Visual + photog lookout Comet Levy.

Comet Levy pic

8380 ~~M22~~ 0430-0530 / 10-f / JM4 / Miranda / - / CN3 0^h30^m E. Suspect not a comet.

8381 E / Mon 24/25 / 1908-2208 / ~~10~~³-F / JM4 3 / Cordelia, Mariana / - / CN3 F: / Sandy Shehee
Comet Levy pictures. Moon near Antares

8382 M2. 0400-0530 / 10-f / JM4 / Miranda / CN3 +
0^h30^m E

observed Comet P/HMP.

25 UT 11:40 $M_1 = 8.1$ Coma 2' DC=4
Coma has sharp edge, Tail 15' in PA 270°
Straight + narrow, w/ ~~Miranda~~ Miranda.

8383E. Sep 25/26 | 1900-2100 | 3-f | JM3 / Miranda
Minerva, Cordelia | CN3f: clouds,
so no looks or pictures of Comet Levy.
Sandy was present.

8384M2 0430-0500 | 10-f | JM3 / Minerva - /
CN3 0^h20^m E. Comet P/H-M-P.
11:50 UT $M_i = 8.3$ Coma 2' DC=3.
Notail seen. observation with
Minerva.

8385E Wed 26/27 | 1915-2045 | 10-f-7- | JM3 /
Cordelia, Minerva / Sandy /
Comet Levy pictures.

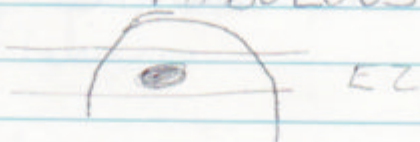
8386M. 0200-0530 | 10-f | JM2, 4 / Ophelia
Minerva, Miranda / Pics of Mars &
Aldebaran.

2415	{ 0120	5 min	Mars-Aldeb.
Ophelia	{ 030	"	"
	{ 0500	"	field of HMP.
Cordelia	0440	"	

*8387E Thu 27/28 | 1830-1945 | 7-f | JM43 / Cordelia,
Minerva / Pics of Comet Levy.

*8388E Fri 28/29 | 1830-2000 | 7-f | JM43 / Cordelia
remounted for this occn. Pic of 1990c
and NGC 5986.

Monday
 → Tues Oct 2/1908-2000/10-7-F/SM4/Miranda/Saturn
 8389E Wednesday, Oct 3/1908-2000/7-Fm/SM4/
 8390E Miranda FABULOUS white spot on
 Saturn



8391E Sat Oct 6/1900-1930/check on moonrise
 8392E Sun Oct 7/1908-2100/10-F/SM4/Miranda/-/CN3/1
 8393E Mon Oct 8/1915-2200/10-F/SM4/Miranda/-/CN3 2
 8394E Tues 9/1908-2300/10-F/SM4/"1-/CN3 3^h W.
 listened to "Imagine" beautiful comet hunting song
 8395E Wed 10/1900-2330/10-F/SM4/1^h30^m W. CN
 Russ Sampson 10/10/90 & Susan Gurozak

8396E Thu 11/12/1908-0000/10-F/CN3
 SM4

CN3F.

90-10-12-120	30	5min	M31	21 44	2
12-320	40	5min	BAnd	21 50	
520	50	5min	2And	22 08	6

8397MP 12/13/ 0300-0310 19-F/betw Phx + Tucson
 8398M2 0530-0630/10-F/7-F/SM3/binoculars/
 CN-5.

8399AN 13/14/ 0830-0530/10-F/SM4/10-F/

1 only	0220	5min	M42		
42	0253		B Ori		earlier KPNO
42	30517		2 Ori		w 8" Celestron
2	0				and Pegasus
					M Roger J.
					Scotti, T Gehr

CN3 45^mE

Monday
 → Tues Oct 2/1908-2000/10-7-F/SM4/Miranda/Saturn
 8389E Wednesday, Oct 3/1908-2000/7-Fm/SM4/
 8390E Miranda FABULOUS white spot on
 Saturn



8391E Sat Oct 6/1900-1930/ check on moonrise
 8392E Sun Oct 7/1908-2100/10-F/SM4/Miranda/-/CN3/15
 8393E Mon Oct 8/1915-2200/10-F/SM4/Miranda-/CN3 2^hW
 8394E Tues 9/1908-2300/10-F/SM4/"1-/CN3 3^hW.
 listened to "Imagine" beautiful cornet hunting song.
 8395E Wed 10/1900-2330/10-F/SM4/1^h30^m LW. CN3.
 Russ Sampson 10/10/90 & Susan Gurozack

8396E Thu 11/12/1908-0000/10-F/ CN3
 SM4

CN3F.

90-10-12-120	30	5min	M31	21 47	2
12-320	40	5min	B And	21 50	4
520	50	5min	2 And	22 08	6

8397MP 12/13/ 0300-0310 19-F/betw Phx + Tucson
 8398M2 0530-0630/10-F/7-F/SM3/binoculars/
 CN-5.

8399AN 13/14/ 0830-0530/10-F/SM4/10-F/ SM7

101 0220 5min M42
 142 0253 B Ori earlen KPNO
 142 30517 2 Ori w 8" Celestron
 2 0 and Pegasus
 CN3 45^mE M Roger S.
 Scotti, T Gehrb

8400M Sunday 14/15
0100 - 0530 / 10-F / JM 2, 4 /
SM: Ophelia, Minerva

CN3F

90-10-15-1, 2	0150	B Ori	} → 4 1/2 min	3:04	9, 10
3, 4	0159	α Ori		3:15	11, 12
✓ 5, 6	0208	δ Ori		3:25	13, 14
7, 8	0218	λ Gem		3:35	15, 16.

CN3 1^h E.

8401E Mon 15/16 / 1900 - 1940 / 10-F / JM 3 / Minerva (-)
CN3 0^h 20^m W.

8402M 0430 - 0600 / 10-F / JM 4 / Miranda (-)
CN3 1^h E.

8403E Tues 16/17 / 1900 - 2000 int / on road W of
Phoenix.

8404E Wed 17/18 / 2200 - 0000 - / Warren Rupp
observatory 3 clouds. Dave Hartsel,
Jack Newton, ~~Dave Hartsel~~.

8405E Thurs. 18/19 / 2300 - 0000 / Warren Rupp. Cloudy,
wind, computers.

* 8406EM Fri. 19/20 / 1900 - 0100 / W.R. / 10-F / CN3 2^h with
Bob Bunge's telescope, 10" Dob, many others.

8407E Sat 20/21/1945-2230/3-f/^{EDT}Warren Rupp/
Jay Hartsel, Peter, Steve, & Jack Newton, Don
Parker / 31" Telescope.

8408AN Sun 21/22/2000-0600/10-F/Palomar/G+C
Shoemaker/CN3G- 50 good films.

8409AN Mon 22/23/1900-0600/10-F/Palomar/G+C
Shoemaker/CN3G- 50 good films again!

8410AN Tues 23/24/1900-0600/10-F/Palomar/G+C
Shoemaker/CN3G- 4850 good films!

#8411AN Wed 24/25/1900-0600/10-F/Palomar/G+C
Shoemaker/CN3G- 50 films, [later Pish-L-3]

8412AN Thu 25/26/1900-0630/10-F/Palomar/G+C
Shoemaker/18" Schmidt/50 films.

8413MS Fri 26/27/1800-1815/3-f/San Diego/Sunset.

8414M2 0000-0530 int/10-F/Tierra del Sol, CA/
Marilka Emery et al. / 13" pl. et al.
CN3 1st CN3 independent find of
Comet 1990i.

8415S Sat 27/28/1755-1815/3-F/Sunset again.

8416M Sun 28/29/0530-0545/9-F/JM43P 7x50/
CN5 TH.

8417M Mon 29/30/0515-0530/10-F/SM3/7x50b/
CN5 TH.

8418E Sunday Nov 4/5/1900-2000/10-7-f/
JMY/Miranda -1 CN3 40m W.

8419E Mon Nov 5/6/1900-2108/10-f/JMY/Miranda/
-1 CN3 1^h30m W.

8420E Wed 7/8/2015-2100/2-f but clear in West/
Miranda -1 CN3 0^h35m W, also moved
Munera to car.

8421M Thu 8/9/0100-0115/7-fm/Gala Bend/Munera

8422M Fri 9/10/0330-0345/7-fm Palomar house/Munera.

8422³AN 10/11/1900-0400 PST/3-f/Palomar/CN3G - 24 films.

8423⁴AN 11/12/1900-0400/2-f/Palomar/18"/G+C Shoemaker/3 films

8424⁵AN 12/13/1900-0500/10-f/Palomar/18" + Munera/G+C
Shoemaker/55 films CN3g.

8425⁶AN 13/14/1900-0515/1-10-f/Palomar/18" Schmidt/
G+C Shoemaker/5 36 films, mostly after
sky unexpectedly cleared. CN3G + G+C Shoemaker

8427⁷AN 14/15/1800-0430/10-3-2-f/Palomar/18" + Munera/
G+C Shoemaker/46 films.

Comet found by Carolyn (overtaking)
at 148 50.34 0 25 36.7
M1 = 13.

8428AN 15/16 Nov / ~~2000~~ 1800-0500 / 3-F / Palomar / 8", Minerva /
Gene, Carolyn, Jean, Carolyn finds a
a comet on field 8-6 last night.
Jean and I measure. Tonight's
position is
16.27881 1 48 15.35 + 0 10 37.3

8429AN 16/17 Nov / 1800-0530 / 3-F / Palomar / 8", Minerva /
Gene, Carolyn. Several films. Kinda cloudy.
Few images of Comet Shoemaker-Levy.

8430E 17/18 Nov / 1900-1930 / 3-F / San Diego / Jean. Very nice

8431M2 0455-0540 / 10-F / AirPk Rd, NW of Tucson /
Minerva / CN3 Opt. 30mNE

* 8432EM 18/19 Nov, Sunday / 19-F 2100-0200 / 10-3-F /
JM4 + S. walk / Comet Shoemaker-Levy
with Miranda 0515UT, M1-12.8 (Nov 19, 22)

8433M 20/21 Nov / 0430-0540 / 10-F / JM4 / clearing after
Sperm / - / CN3 w/ Miranda 1^h 15^m E. Very nice
observing session, an hour before leaving
for Montreal.

8434G. 23 Nov / 13:00-13:30 / 10-3-F / JM4 / Oso observatory /
8" Celestron / Leo / Sunspots. 1 large group ^{moving off}
Lo Enright. It was great to observe the ₁ off.
sun today with you
RSN 110 for Nov - 23 110

8435M Sat 24/25/0200-0215/13-F/ Rolf Meier's house
hazy sky, no aurora.

8436M Thursday 28/29/30/ Nice observing session
during walk. 0100-0200/ 3-F/ 818+ Summer

8437EM Fri Tues Dec 4/5/1830-~~1930~~^{0500int}/ 10-F/ JMY/
Miranda/ -/ CN3. ~~EA~~ 1^h15^mW. CN3e N Crv.

8438EM Wed 5/6/~~28~~^{0530int} 2030-~~2100~~/ 10-F/ JMY/ (Miranda)
CN3 0^h45^mW. (N Crv CN3e.)

8439EM Thu 6/7/ 1830-~~2230~~^{0500int}/ 10-F/ JMY/ Miranda/
CN3 4^h30^m. CN3e N Crv.

8440⁴⁰EM Fri S ~~0430-0500~~ 0515-0530/ 7-F/
JMY/ Miranda/ -/ CN3e N Crv (again?)

8441~~AM~~EM Fri/Sat 7/8/ 0508-0515/ 7-F/ JMY/
Miranda/ -/ CN3e N Crv.

8442E Sat 8/9/ 1800-2330/ 10-F/ JMY/ Miranda/ -/
CN3 2^h15^m. NGC 7177 fooled me. but didn't
really look cometary.

8443M2 0515-0530/ 7-F/ JMY/ Miranda/ CN3e N Crv.

8444M Sunday 10/11 9/10/ 10-F/ JMY/ ~~Asphelia~~ - CN3FA

~~8445M~~
78446
Dec 12/13/ 0200-0500/ 3-F/ JMY/ N Crv <14.0.
Geminals 34 + 38 betw. 3:55 and 4:55

8445E Mon 10/11/ 8pm PST - 11pm/ Edwards Air Force Base/
• binoculars/ Steve Edberg + Mark Coca/ SHUTTLE.

8447.

MST	OphC	OphB	
12:42	Regulus	N of Regulus	5min
12:54	M44		7min
1:05	1		25min
1:10	1		5min
1:1			

11:51 MST • 12-14-90 We came, it was cloudy, we ate chips and
left J Cannon & R. R. R.

14 December 1990 "We think not"
Jim, Katrianna, Jennifer + Christopher

8445 EM Friday Dec 14/15/1830-0300/1-F/5MB ↑

8446 AM Mo Sun 16/17/0530-0600/10-F/5M4/
Miranda/CN3 20^m E. NGV C14

8449 AN. Mon Dec 17/18/1908-0630/10-F/5M3,2/
CN3 0^h45^m W, M30. with Munera
CN3F.

		OphC		
2 Gem	Castor	Pottox	23 ⁰¹ 23 ¹²	00:26, 00:35 5min
B Gem	Pottox		23 22	00 44 "
F Gem	1 2 CMi	Procyon	23 32.	00 53 "
F Gem	M44		23 41	01:04 "
	Field "1" close		00:07	01:12 "
	Regulus		00:17	

CN3 1^h20^m W, E all night.
Comet Levy 1990c observed.

↑
in addition
to
the 45?

#8450AN

Dec 18/19, Tues / 1830 - 0700 / D-F/M + Bigelow /
61" / Steve Larson /

CCD	Periodic Comet Harrington-Abell	- no sale	Tape
"	Mueller - 2	CCD only	60-3, 5, 7, 9,
"	Mueller - 3	"	60-11, 13, 15
"	Shoemaker-Levy		60-17
"	2 spectrum images		
	plus several F-band images		

We took several ^{then} images of 1990UL3, which Carolyn found on images ~~to~~ we took in October. In all the images, this object has a tail. We Steve combined the images and the tail ~~image~~ was then measured in P.A. I had ^{earlier} suggested that we take some deep images of 1990UL3⁰⁰, but the Spectra of P/Shoemaker-Levy took so long that we thought we had lost it for the night. There was, fortunately, enough time to take seven 5-minute exposures. Steve regularly images new interoids for this purpose - 20 or so, to look for comae, for years.
PA 58°

We then took a star trail image, to calibrate the exposure PA. Steve then measured the length of the tail as 28".
Finally, we sent the following message to Brian.

S. Larson and D. Levy (University of Arizona) report that 7 co-added 5 minute exposure Cousins Red band CCD images taken with the Catalina 1.5m telescope on 1990 Dec 19, 3216 mid UT show that the object identified as 1990 UL3 sports a 28 arc sec tail at PA 58 degrees.

Then a copy was sent to Gene.

Next object.

1990m P/Taylor.

Finally a marvellous oblique view of Comet 1990c!

Steve thinks that tail is 66,600 km long. - correcting for phase effect + viewing geometry.

8451EM

Dec 19/20/ 1830-0308 / 10-F/cold, high wind / 61" / Steve Larson / 1990 UL3 with Cousins R+ Harris V filter, + Harris B.

then standard star. Hyades 64
HD 28099

Clouds at 12.30. At 10:15 I obtained a visual observation of what likely will be called P/Shoemaker-Levy 2.

It all began in MONTREAL, my last night, when after 8436M I checked the ephemeris and read for the first time about UL3.

Apparently it was on films taken during session 8411 AN, and routinely followed up during the November run. After the beta orbit came out it looked as though it was a Jupiter-crosser. Even that first Montreal night I thought "could it be a comet?" Then Jim Scotti thought too it might be. Well, it is!

8452S December 23 - Enjoyed being with you and the cats but especially the telescope (16") and Photographic set-up plus the snow!! Love you

8453M { Dec 25/26/ 5:30-6:00/ 3-F/ SM4/ Steve & Donna. Mother

8454E } CN3 30ME } → 2300-0000/ 16" / Steve, Donna.

8455EM Dec 30/31/ Jan 1/ 2300-0100/ Tim Hunter's hot tub/ Steve and Donna.

1991

(8456S) Jan 3/4/ 4/5/ ~~2300~~ 0300-0430/ 1-0- / KPVO/ Mother, Ed, Alan Hale.

(8456E) Jan ~~4~~ 2/3 / 2300-2300/ Radisson Hotel/ Mother + Ed/ Mars.

8458E 7/8/ ~~1900-2300~~ / 6/7/ 2100-2200 / Tim's hot tub, ^{later} CN3 15m

8459E 7/8/ 1900-2300/ 10-3-F/ SM4/ Alan Hale. Ophelia: possible image of P/Shoemaker-Levy. P/Metcalf-Brownington ^{8pm M1=8.7}

8460E. Jan 10 - spent a few hours with David checking on ^{Ara M1=10.8 10pm} asteroid references. a wonderful time, as always! _{CD=2' DC}

1991

- 8461M Jan 12/13/ 0200-0600/10-F/5M4/CN3 2^h E.
- 8462M Jan 13/14/ en route to Palomar, ending with attempt to see Barium - Lithium releases from satellite.
CRRES.
- 8463M Jan 14/15/ with Jean, intermittent views of sky.
- *8464AN Jan 15/16/ 1800-0530/10-F/5M4 Palomar/18"/Gene, Carolyn / 50 films, including 1990c.
- 8465AN 16/17/1800-0500 PST/10-F but strong NE Santa Ana wind / Palomar/Carolyn, Jean for a while / 50 films. CN3G
- 8466AN 17/18/1800-0515/10-F/ Palomar/Carolyn/18" Schmidt/45 films 44 films
- 17.72 $11^{\circ} 11' 7'' - 27^{\circ} 07'$ Daily motion $-0.51''$
Possible McNaught comet and $-4.8''$
- 8467AN 18/19/1800-0430/10-3-F/ Palomar/ CN3G. $M_1=17$ Thirty-Something films. / Gene + Carolyn, Jean.
- 8468AN 19/20/1800-0400/10-1-F/ Palomar/ G+C Shoemaker / G+C Shoemaker, and Jean! $\sim 3 \times 28$ films!
- 8469AEM 20/21/1800-0130/1-2-F/ Palomar/ G+C Shoemaker, Jean / clouds.
- *8470M 23/24/22/1800-0630/3-10-F - cold + windy / Palomar/ G+C Shoemaker, Jean / clouds, then clear, cold windy. Carolyn later finds Comet 1991 in these films.

- 8471M Jun 23/24/0530-0610/10-F/JM4/Miranda/-
Lima Bean, Boulder/ CN3 0h30m ~~W~~ E.
- 8472M 26/27/0028-0200int 17-Fm/A Moon bright
- 8473M Jun 29/30/0500-0230/7-Fm/SMF.
- 8474M 30/31/0530-0610/7-Fm/JM4/Miranda/-
CN3 15m E, check for ? new comet for Dan Green
- 8475E 31/1 Feb/ 1900-2008/9 10-3-F/Miranda/
CN3 45m W.
- 8476E 1/2 Feb/1900-2015/10-3-F/JM4/Miranda/-/
CN3 0h50m W. Clouded over.
- Sat 2/3/1830-2208/10-F/JM4/Miranda/-/Sandy
CN3 2h50m W.
- 8477E Hi DELI DAVIDS CHAIR ON A SUNDAY 2-3-91, IT
8478S WAS A JOB WELL DONE THAT TO MORE TIME THAN I THOUGHT
IT WOULD, BUT IT WAS WORTH IT FOR DAVE: I helped too - Rabbit
Sun 3/4/19: 1330-1400/10-F/JM4 chair delivery
Echo - 60p Sun spot - large groups
- 8479E2 1845-2108/10-F/JM4/Sandy Sheehy/
Miranda / CN3 1h30m W.
- 8480E Mon 4 Feb/18: 2100-2345/10-7-f/JM4/
Miranda (later) Frank Lopez/ CN3 1h W.
- 8481M2 0200-0245/7-fm/South walk.

DAVID'S
"THE GREAT FEBRUARY
ODYSSEY."

8482E Tues 5 Feb / ~~1900~~ 1830-1950 / 3-10-F / JM4 /
Miranda / CN3 0^h40^m, before leaving for airport.

8483M2 0330-0345 / 10-F / Palomar home.

~~8484~~ ~~MEM~~ Wed 6/7 Feb
8484 ~~MEM~~ 1830-0308 / 10-7F / Palomar / Gene + Carolyn
Shoemaker / 18" Schmidt / 32 films.

***8485AN Thur 7/8 Feb / 1830-0430 / 10-F / Palomar / 18"
Schmidt / Gene, Carolyn, Sean measuring
at the 48" Schmidt and Steve Larson at
the 61" taking confirming images.
Early this evening Carolyn discovered a
comet on films taken by Gene + me last
night. Its position was 9 20 10.76
+13 28 178
and tonight 9 19 28.22
+13 29 53.0
What a way to start an observing run!

8486AN Fri 8/9 Feb / 1800-0430 / 10-F / Palomar /
18" / Gene and Carolyn / ~40 films. Comet
found near 12^h +2^o.

8487AN Sat 9/10 / 1800-0515 / 10-F / Palomar / Gene +
Carolyn / 54 films, including Comet Aug 1990c.

8488AN

Sun 10/11/1830-0430/10-3-fl 18"

Carolyn, Gene, Jean / New comet confirmed during 2nd set of films. This afternoon, Carolyn found the comet on films taken during session 8486AN. She now

passes Brooks to be the world's second most productive comet hunter of all time.

For me, this new comet brings my total to 6+5, or 11 comets.

After the clouds came, Jean and I tried to get accurate positions.

My ~~the~~ measuring went ok, but the program crashed when it did silly things, so no reductions were made.

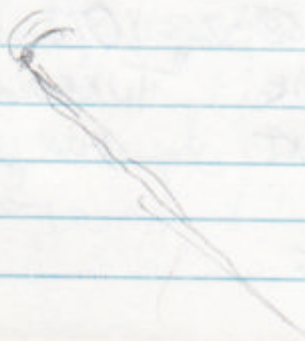
There really is now an argument for increased use of my baby Schmidt's this summer. That leg of the comet hunting triad needs more work urgently, especially now that the other two are so successful.

So On Sunday afternoon I was updating the observing log. Gene was in the darkroom. I then set to work on a new variable star that Carolyn discovered on our films the other night - it had gone up 1/2 magnitudes in 44 minutes. A last night's film it was up some more to fifteenth magnitude. I was about to check the GCVS at the 200-mch

when Carolyn looked up from her stereo scanner. Actually she hardly looked up from it - she said "I have a comet!" I then checked the IAU cal on-line catalog, that listed no object in that region, and then we promptly reported the position from the 8/9 films.

We confirmed the comet tonight

- 8489EM Mon 11/12/1845-0300/2-f/Palomar 18"/
Jean, Gene & Carolyn. No films tonight.
- 8489AN Tues 12/13/1845-0500/10-f/-3-f/Palomar 18"/
Jean finds 2 SN/ Gene & Carolyn / 56 films!
- 8490E. Thurs 4/15/1900-0200 EST/3-f/Winter
Star Party, Florida Keys - Spanish - Key!
Lots of scopes
- 8492AN Fri 15/16/1930-0530/3-f/WSP/CN3 1^h with
30", ET S. Many telescopes. Comet
Levy 1990c, through many of them, with
her antitail.



8493E Sat 16/17 Feb / 1930-2300 / 10-F / Winter Star Party / lots of fiber copies Comet Levy with beautiful antitail.

8494M2 0415-0630 / 10-F / WSP / 20" / Elizabeth Doucette, Tom Clark, Ed Bontwell / CN3 1h 45m E.

8495E Sun 17/18 / 2055-2300 / 3-F / WSP / Comet Levy with fire, wider than last night, antitail ~2°.

8496E Mon 18/19 / 2200-2330 / 2-F / Palm Beach.

8497S Wed 19/20 / 1730-1830 / 7-F / S. of Sarasota / Sunset / Elizabeth Doucette.

8498E2 2230-2300 / ~~10~~ 3-F / Sarasota / Paula Epstein

8499M Sat 23/24 / 03:30-0530 / 3-F / SM4 / Miranda / CN3 + 0h 45m E. ODYSSEY ENDS

8500E Thu 24/25 / 2030-2300 / 2-F / SM4 / Miranda MARCH Frank Lopez

8501E Sat ~~26/27~~ / 2200-2210 / T-F / Tucson / Liz Maggio.

8502E DAVID MARCYJANIK "TURBULATION" IS THE WORD
2405 RIDGE RD EXT FOR THE WEEK

AMBRIDGE PA 15003

412-266-5505

Sun 7/3/4 / 1900-2345 / 10-3-F / JMB

Muscivora, Minerva, Ophelia (CN3 2h W.
Moon, Jupiter. Comet during 1990s.
Anti-tail $9\frac{1}{2}^{\circ}$ S.

Formerly
(2 weeks
ago) from
light polluted
Western Long
Island, NY

MICHAEL TEREZONI

5755 E RIVER RD #3602

TUCSON, AZ 85715

(602) 577-6857

*ALOT DIFFERENT

THAN NY - UNUSUAL TO

SEE 6th STARS IN A

"SUBURBAN" NEIGHBORHOOD

8503E 2 4/5/1900-1940/10-F/JM3/Minerva/
-/CN3 10m W.

8504M2 0200-0230/7-3-F/JM4/Minerva/NGW-C12

8505E 5/6/2230-2315/10-F/JM4/Muscivora/-/
CN3 30m W, vint; CN3e NGW-C14. Jean Mueller.

8506M 6/7/0200-0240/3-F/Southwalk/Jean.

8507S. 7/8 10100-0130/10-F/JMF/Echol/Jean/Sun.

8508E2 7/8/1920-2015/10-F/near El Centro/Minerva/
Jean CN3 5+25=30m W.

8509EM 8/9/1900-0300/10-F/Palomar/G+C,
Shoemaker/CN3FF 37 films.

8510EM 9/10/1900-0100/1-F/Palomar/CN3G

8511EM 10/11/1900-0100/1-0-F/Palomar/CN3G

8512AN 11/12/1900-0500 PST/10-F/Palomar/
G+C Shoemaker/CN3G: 50 films. On Field
58+12, Carolyn the next night found
a 17th magnitude comet. Also
got nice image of 1990c.

Variable Star in Leo Minor

Apr 4 1954 ~ 16th
 17/18 Feb 1988 Star 14th mag brighter than ever
 19/20 Mar 1988 a bit fainter, ~~14th~~: 15th 14^{1/2}
 10/11 Feb 1991 15th magnitude

RA (1950.0)

10 29 43.3 +36 36 32

8513EM 12/13/1900-0300 / 10-3-1-F / Palomar /
 C + G Shoemaker, 26 films, including
 attempt at confirming new comet.

rate of motion -5' arc in dec / day
 -3' time in RA / day

8514MEM 14/15/1900-2100 / 3-1-F / Palomar / C + G Shoemaker,
 Terry Dickinson, J. Mueller / picture

8515M 15/16/0400-0420 / 2-F / 3AF + Southwalk,

8516M 16/17/0430-515 / 10-F / 3MF4 / Miranda / CN3
 0^h 25^m WE.

8517M 18/19/20/0320-0530 / 10-3-F / 3M4 / Miranda / - /
 CN3 1^h 30^m E.

Gardner Gleeckly - wonderful sky, several
 showy meteoroids, great
 viewing.

8518M Tues Mar 26/0³⁴⁵0900-0915 / 10-F / 3AF / Steve + Donna's
 house / Sun.

8519M 29/30/March / 0030-0115 / ~~10~~-F / 7-F /
8187 summit walk / Full Moon, Passover.

8520E April 6/7/~~8~~ 3/4 / 2030-2330 / 10^T-F / 3M4 / Mir
CN3 ~~#~~ 3^hW

8521E 4/5 | 2100 2030-2145 / 10-F / 3M4 / Miranda / CN3 1^hW
Echo - Observed Comet Levy κ 10.2

8522EM 6/7 / 0100-0115 / 10-F / 3M4 / Miranda / CN3e Nov
-14.

8523E 7/8 / ~~0100~~ ¹⁹³⁰⁻²³⁰⁰ ~~0115-0130~~ / 10-F / 3M4 / Miranda /
CN3 1^h30^mW.

8524M ~~8/9~~ ^{8/7/8} / 0400-0530 / ~~10~~-F / 3M4 / Miranda / - / CN3 0^h45E

8525EM ~~9/10~~ ^{8/9} / 0100-0115 / 10-F / 3M4 / Miranda / - / CN3e Nov.

8526EM 2 0500-0515 / ~~10~~-7-F / 3M4 / Miranda / - /
CN3 5^mE.

8527AN 9/10 ~~Wed~~ / 1700-0500 / 10-F / 61" / Steve / Minerva
CN3 25^mE. Several comets with CCD

8528AN 10/11 / Wed / 1900-0600 / 10-F / 61" / Steve Larson /
CN3 25^mE.

P/Shoemaker-Levy 4, $M_i = 16.9$.

8529M 11/12 Thu / 0300-0400 / ~~10~~-F / 1-F / 3M4, walk.

8530M 12/13 Fri / 0300-0330 / Palomar

8531AN April 13/14 / 1900-0500 / 10-F / Palomar /
Gene + Carolyn Shoemaker / CN3G 40+ films

8532AN 14/15 / 1900-0500 / 10-F / Palomar / G+C Shoemaker /
18" Schmidt / CN3G 40+ films

8533AN 15/16 / 1900-0500 / 10-F / Palomar / G+C Shoemaker /
18" Schmidt / CN3G 40+ films

8534AN 16/17 / 1900-0500 / 10-F / Palomar / G+C Shoemaker /
18" Schmidt / CN3G ~~40~~ films taken = 46.

~~8535AN~~^{EM} 17/18 / 1900-0300 / 10-F / Palomar / C+G Shoemaker /
CN3G - clouds.

8536AN 18/19 / 1900-0500 / 10-F / Palomar / C+G
Shoemaker / - / CN3G.

~~8537AN~~ 19/20 / 1900-0500 / 10-F / Palomar / C+G Shoemaker /
CN3G.

~~8538M~~ ? 20/21 / 0400-0500 / 10-F / JM4 / Miranda / CN3 30° E

~~8539M~~ 28/29 / 0300-0330 ~ / 7-fm / B Walk.

~~8540E~~ 29/30 / 1900-2000 / 10-F / JM3 / Minerva / - /
CN3 0^h30^m W.

~~8541E~~ 1/2 May / 2030-2200 / 10-F / JM4 / Minerva / Peter
Jedicke, Michael Magee,
CN3 1^h W. at 8:30, very bright meteor
? Eta Aquarid - 10.

8542E. May 2 / 1930-2300 / 10-F / JM4 /
CN3F.

8543EM May 4 / ~~#~~ 2335-0100 / 10-7-F / JM4 /
CN3F, CN3 15^mE.

8544EM 5/6 / 1930-0200 / 10-3-F / SMB / Miranda,
Ophelia / CN3F. Comet Levy clearly recorded.

8545EM 6/7 / 2200-0230 / 10-F / JM2, 4 / Miranda /
Ophelia / CN3F. Comet Levy with Miranda.

8546AN 7/8 / 1900-0500 / 10-F / Mt Bigelow / 61", Minerva / S. Larson,
Peter Seduiche, Tim Spahr / Comets Levy, 1990,
P/Shoemaker-Levy 1991e, Helin-Lawrence 1991k,
P/Shoemaker-Levy 1991d, P/Hartley / 1991j, Wild 2,
Moon Saturn, CN3 20^mE

8547AN 8/9 / 1900-0530 / Mt B / 61", Minerva /
S. Larson, Peter Seduiche, Tim Spahr / Comets Levy, 1990,
P/Shoemaker-Levy 3 + ~~4~~ Shoemaker-Levy,
P/Shoemaker-Levy 4, Helin-Lawrence, P/Hartley,
P/Takemiyawa

8548M 9/10 / 190200-0430 / 10-F / JM3, 4 / Miranda,
Minerva / Peter / CN3 Q 1h 45^mE

8549M 10/11 / 200-0415 / 10-F / JM4 / Miranda / Peter
CN3 1h E

8550M 11/12 / 0200-0440 / 10-F / JM4 / Miranda, Ophelia /
- / CN3F, CN3 15^mE

8551M May 11/12 | 0200-0300 / 10-F / JMB / Peter.

8552M 12/13 | 0300 MDT - 0600 / 10-F / Texas Star Party

8553AN 13/14 | 2200-0600 / 10-F / TSP.

8554AN 14/15 | " / CN3 1h.

8555AN 15/16 | "

8556AN 16/17 | "

8557AN 17/18 | " / CN3 3h E.

8558AN 18/19 | TSP

8559M ~~19/20~~ 20/21 | 0200-0300 / 10-F / JMY / Peter, EMS

8560MS ~~21/22~~ 24 May | 1300-1700 / Riverside

8561E2 Riverside

8562MS 25 May | "

8563E2 "

8564S 26 May | "

8565E2 " windy

8566E 29/30 May | CN3 30m W. Riverside

8567E 30/31 May | CN3 1h W.

8568E JUNE 2/3 | 2100-2300, 10-F / JMY / Miranda /

- 1 CN3 15m. W, E. Fixed finder CN3a.

8569E 3/4 | 2000-2300 / 10-F / JMY / Liz / CN3 ~~3h~~ 4h

Possible Auroreal Spot in North. 1h W, E.

8570E 4/5 | 2200-2300 / 10-F / Phoenix / Sandy

8571E 5/6 | 2000-0000 / 10-F / JMY / Miranda /
Saw Comet Levy 1990c, probably
last time.

2000, M1 = 13.2 CN3 15 min

8572S - 10/11, Mon / 1900-1915 / 2-F / Echo, 60p / Sunspot.

8573EM - 11/12, Tues / 0300-0350 / 2-3-F / S. walk.

8574E - 12/13/03 1900-2130 / 3-F / JMB + Lemmon,
then Bigelow / HST. Very nice
Conjunction of Venus, Mars, + Jupiter.

8575M2 - 12/13 / 030245/0315 / 3-F / JMF.

8576S - 13/14 / 1300-1315 / 3-F / JMB / Echo, 60p / Sun.

8577E2 - 2150-2210 / 2-F / JMF / Miranda / - /
attempt for NGC, which I know is in outburst.
Cloudy.

8578M3 - 0335-0530 / 10-F / JMF / Miranda / - /
CN3 2" E. Found a comet as follows:

03:45	1	42.2	+13	32	M ₁ -7g
04:10	1	42.4	+13	34	

Comet 3', no tail.

8579E - 14/15 / ²¹1900-²¹1930 / 7-F / Clyde's house / Patsy + Clyde /
Beautiful conjunction of Venus, Mars and Jupiter.

8580E - 15/16 / 2030-2215 / 7-F / Clyde's house + Walters
house / 10", then 8" Spica Conjunction
A most beautiful quadruple conjunction - $\Delta \approx 40''$

Heartily congratulations to a comet-discovering
teen friend on his first dozen discoveries! - Walter
We enjoyed observing the conjunction tonight
with my 10-inch / fmm. 70X
Clyde W. Tombaugh

8581E

Jun 16/17/2045- 2105/10-7-F/SM4,3) Leo on phone /
• Mars beautiful conjunction, CN3e NGV. C19
• Jup Venus

*8582EM2

0300-0415/10-F/SM4/Miranda/-/ CN3 45^mE
Comet Levy 1991g at $M_1 = 7.6$, bluish, sunward fan,
DC=5. $CD = 3'$. Very pretty comet.

$i = 29^\circ$ 1950.0

1991g	18.3	2 ^h 0.4	+ 16 24
	18.4	2 0.9	+ 16 28
	18.5	2 01.4	+ 16 33

1991r

$i = 5$

	18.3	16 33.4	- 21 48
	18.4	16 33.4	- 21 47
	18.5	16 33.3	- 21 46.

~~8583~~

IAUC 5293.


S. Larson, D. Levy, and T. Spahr, University of Arizona, report that, when observed with the Catalina 1.5m reflector on June 18.45UT, the comet exhibited ion streamers, a dust fan, and one or perhaps two dust envelopes. A spectrum shows CN, C₂, C₃, H₂O+, and possibly NH₂.

8583AM 17/18/1900-0608/7-F-10-F/Mt Bigelow/Tom Spahr, Steve Larson 16" + 16" Schmidt.

Arcturus	RA	Dec	Time	A/Mag	Observer
SAS 1	136.3	+29 39	. UT	8th 0	David
68 2	044.0	+15 34			"

8584M 18/19/0200-0400/3-F/Phoenix - Eloy.

8585M 19/20/0300-0400/10-F/SM3/Mirival - CN3
15m E

8586AM 20/21/1900-0415/10-F/SM3, 4/Ophelia, Miranda/
Garry Rosenbaum and Terry Lappin in evening/
CN3 F, Breakfast with Comet Levy. 

8587M 21/22/0300-0415/10-F/SM3, 4/Ophelia, Miranda/
- CN3 15m, CN3 F. Comet Levy 1991g

8588M 22/23/0230-0415/10-F/SM4/Miranda - CN3 45m E.
Comet Levy 1991g

This makes your 7th visually discovered comet and
I've seen all of them! It had a beautiful sunward
fan but no tail that I could see and it was nice
and bright the way a good comet should be. Thank you
for such a wonderful view. Michael Mayer

90
8589E 30/31/2130-2145/9-F/Flagstaff -|-|.

8589E 22/23/2425/21:00-22:45/3-F/Lowell Obs/ACM/
24" / double star.

8591E 31/1/2000-2300/10-F/SM3/Mirival - CN3 1h W.

8592E 1/2 July / 2100-2300 / 10-3-f / SM3 / Minerva / - / CN3 1^h W

8593E 2/3 / 2100-2300 / 10³ f / SM4 / Minerva / - / CN3 1^h W

8594E 3/4 / 2100-2300 / 3-f / SM4 / Minerva / 1^h W.

8595E July 9/10 / 2200-0220 / 2-f / Grand Baja Hotel / Sky + Tel Solar Eclipse Star Party 1.

8596EM 10/11 / 2100-0030 / 8-f / Gran Baja Hotel / many people / Star Party - meteors, M4.
RCB b.1

8597S July 11, 1991. 0900-1330 / -f / Gran Baja, LA PAZ, Mexico. / Ophelia.

The Sun is in Gemini, very close to δ Gem where Pluto was discovered in 1930.

PLAN
1. Watch shadow approach and "up" to dark

2. ~~observe Corona & prominences~~, ~~adapt~~

2. 20 minutes Comet hunt south, along Kreutz path, and check in other directions.

3. observe ^{prominences,} corona and check landscape

4. Diamond Ring or Bailey's Beads

5. Watch departing shadow.

• 2 Gem

PLAN

• B Gem

• K Gem

Sun
• Gemminorum

• 5

11:05 spaces betw. leaves

11:10 darkening, noticeable before 50%

11:25 Temperature dropping, quite dark.

First two minutes: ~~at~~ Corona



CN3 0h 02m

Sky like bright twilight. All bright planets and some bright stars visible. Corona absolutely majestic in Ophiuchus. About one minute before the end, a very large prominence - huge red one - appeared away

from Moon; almost like an independent body
off the Sun. The corona was very bright
about 3 solar diameters East and West. ^{NS}
component changed aspect during the $6\frac{1}{2}$ minutes.

Yes David, discovering a comet
party this. BUT not by more than a
hair.

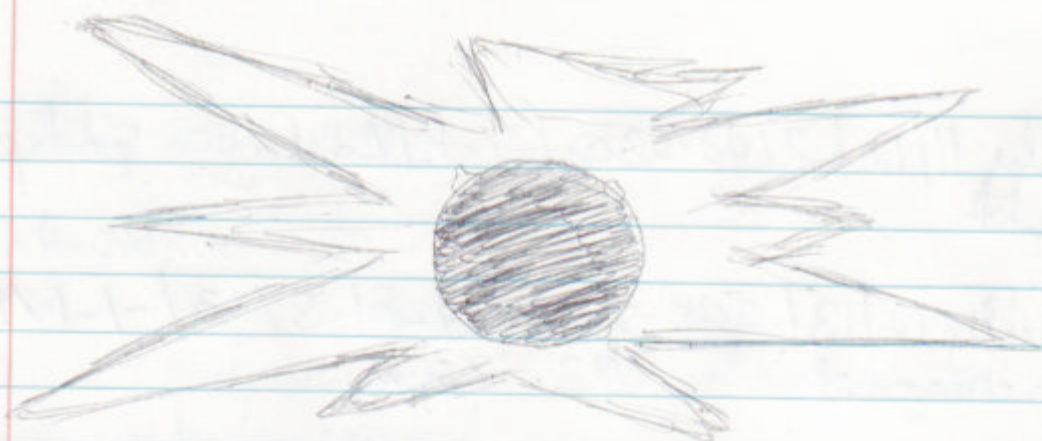
The final diamond ring was very
beautiful, complete with rapidly vanishing
corona. Then, just as quickly as
the onset of totality appeared, it was over.

The eclipse was too short, but long
enough to allow some comet sweeping,
and time just to enjoy the shadow of
the moon.

Other than a tiny patch of cirrus ~ 20 min before
totality, the sky was absolutely cloudless.
The cirrus moved to N and dissipated.



N



W

S

E

This is what the eclipse looked like to me!
Love, Ika.

11.7.91

1:05 - small eclipse left but spaces between leaves still show ☉ this!

1:13 spaces stuff still there.

1:15 "

1:16 "

1:17 "

1:17:30 gone.
4th contact.

8598E July 11/12 / 2100-2300 / 7-F / La Paz. Eclipse night.

8599E July 12/13 / 2000-2100 / 7B-F / 5M3 / -1-1 Moon, thin crescent. CN3 3m W.

8600M July 18/19 / 2100-0100 / 3-f-int / between Las Cruces + Tucson.

8601M2 0215-0500 / 10-3-F / 5M4 / Miranda / -1 CN3 / 4E. very strange cirrus cloud, appearing as a ray from just west of Polaris, changing shape slightly + moving east $\sim 10^\circ$ over almost 2 hours. At times stretched over 30° in length, changed intensity. Acted very much like aurora; the N part faded with twilight, but S part brightened, and reflected red color just before sunrise. Green in Aurora filter.

8602M July 19/20 / 0130-0200-0230 / 3-F / 5M3 / -1-1. Tried Aurora filter on clouds (cirrus) showed greenish but not as much as yesterday's cloud.

*8603S July 20, 1963. (+28 years) 11am-3pm / 3-F / 5M4, 3, 2 / see next page.

- July 20th 1991

David,

Hope to see P/Levy 91q in 2041! Please no new discoveries until end of August till I get back home!

Thanks,

Andrew Pearce

David,

You are truly an inspiration to me! Good luck with your many future comets.
Chris Dole

David,

Congratulations on your past & future work. Your work is of true astronomical value. Looking forward to hearing about future observations / discoveries.

James Athanason

Beardy!

Sorry we couldn't stay longer. You asked what I hoped for the future. How about finding one more comet than you! Wishing you MANY MORE DISCOVERIES
Cheers, Robert A. Wroughton

8604M July 20/21, 1991 / 300-430 / 10-F / JM4 /
Miranda / -1 CN3 0h45m E.

Periodic Comet Levy



M1 = 8.7. OC = 5 3' comet Tail

/

8605E 21/22 July / 2000-2200 / 7-F / SM3 / phone with Peter Collins

8606M2 0230-0415 / 10-F / SM4 / Miranda - CN3 1^h

Comet P/Levy 1991g $M_i = 8.8$ $DC = 6$ Coma 3'
Sunward Tail "fan-shaped at 30-60°, ^{3'} main tail 270°, $\frac{1}{2}^\circ$ length.

8607ME 22/23, Mon / 2000-2200 / 7-F / SM3 / phone with Sandy

8608.M2 0230-0500 / 10-F / SM4 + s. walk / CN3 1^h E.

Comet P/Levy $M_i = 8.8$ $DC = 6$ Coma 3'
Tail 30-60, 270°, $\frac{1}{2}^\circ$.

8609S 23/24 Tues. / 1540-1600 / 3-F / SMB / Echo-60p /
Sun - large spot -

8610E2 1900-~~2000~~-0000 / 3-F / SM2,3,4 / telescope maintenance,
plus phone with Sandy.

† 8611M3 0315-0420 / 10-F / SMB, 4 / Echo, 60p, Miranda /
CN3 10^m E.

Echo: P/Levy 1991g $M_i = 9.1$ Coma 2'.

8612M 24/25 / Wed / 0300-0315 / 7-F / S. walk.

8613M 25/26 Thu / ~~0000~~-0030-0130 / 3-F / SM3 /
C. Cunningham / clouds, full moon.

Had a wonderful time discussing books and the
politics of astronomy with David, who autographed my
copy of his Tomhugh book. A truly memorable two
days. Clifford.

8614M 26/27 Fri / 0400-0430 / S. walk.

~~8615E 31~~

- *8615M July 30/31/ 0315-0400/ 3-F/ JM4/ Miranda/
Comet P/Levy M1=8.9, 3' no tail (moonlight)
Comet quite close, ~1.5" from NGC 1931, my
first comet scare years ago.
- 8616E July 31/Aug 1/ 2100-2200/ 1-F/ JM3/ installed
Minerva's new mount.
- 8617E ~~July 31/Aug 1/ 2100-2300/ 3-F/ JM4/~~
Miranda - CN3 0h 45m W.
- 8618M2 0415-0430/ 2-F/ JM4/ Minerva - CN3
0h 10m cloudy except ~~at~~ low in eastern sky.
- 8619M Aug 2/3/ 0100-0115/ 3-F/ TAA, restaurant
parking lot.
- 8620M2 0330-0445/ 7-Fm/ JM4/ Miranda - CN3
0h 35m E. Comet Levy M9.0.
- 8621M Aug 3/4/ 0000-0130/ 3-F/ JM3/ Minerva / Jim
Scotti. Pictures Milky Way w/ 35mm camera
+ 50+200mm lens.
- 8622M2 0400-0500/ 3-F/ Swalk + JM3/ Minerva/
CN3 5m E.
- 8623M 4/5/ ~~0300-0400~~⁰⁰⁰⁰⁻⁰¹⁰⁰/ 3-F/ JM3.
- 8624E 7/8/ ~~2100-0200~~⁰⁰⁰⁰⁻⁰¹⁰⁰/ ~~1-F~~ 3-F/ U. Mass. / Steve
O'Meara, Don Parker / ^{Minerva} CN3 10m. + 18" m.
- 8625AN 10/11/ 2100-0400/ 10-F/ Stellafane / Miranda
Minerva / 10" + 22" P/Levy 1991g.
- 8626M 11/12/ 0300-0430/ 3-F/ Stellafane / Peter
Sedlike / Perseids, ~~and~~ - 8meters through clouds
+ others CN3 45m E, cloud-hopping

8627M Aug 12/13/02 35-0430/7 F / South of MH,
St Jacques site CN3, Munerwa, 1^h 15^m.

8628EM 16/17/02 2308-0030/3-6-F / Leo Enright's
house, Sharlot Lake / Munerwa 1 CN3 10^m E.
Peter + Diane.

8629S 18/19/1130-1200 / Munerwa. 1.

8630E Monday 19/20 Aug / 2000-2100 / 1-F / Expo's
stadium / Mother / beautiful sunset with red
glow at various times on varying heights of
clouds.

8631M2 0400-0445 / 9-3-F / St. Jacques site / Munerwa (-)
CN3 0^h 43^m E. Beautiful night.

8632M Wed 21/22 / 2100-0000 / 1-0-F / RASC.

8633EM⁸ Sept 4/5 / 05 0400-0440 / 10-F / SM4 / Miranda /
CN3 30^m E.

8634M 5/6 / 4-5 / 3-F / SM4 Munerwa / CN3 30^m E
P/Levy plague installation party - phase 1

8635M 6/7 14:30-5 / 10-F / SM4 / Munerwa / CN3 30^m E

+8636M 7/8 / 0130-0500 / 10-F / SM4, 3C / Miranda, Munerwa
CN3 1^h 40^m E. Two independent comet
discoveries - P/Hartley 2 + Wirtanen.

8637EM 8/9/21 00-0108 / 10-F / SM4 / Miranda / Jim Scott
P/Hartley 2 10:08 UT M_v = 7.8 Comet 6
P/Wirtanen 11:15 18.9 2 J-Miranda
1991 EE, M_v = 12.8. + 1 geost. sat.

8638M 0400-0500 | 10-F-3/SM4) Miranda/
CN3 0h50m E.

8639M 9/10/ 0315-0508 | 2-F/S. walk + SM3
8640M 13/14/ 0000-0200 | 10-F/SM4. Comet P/Levy. CN3
9/13-14 30m E

What a splendid night, splendid sky, and magical
time with you on your roof terrace. Was it Perseid
Comet Levy 1991 you wish me to see - if so, my fifth?
Certainly, you've reminded me of the joys of astronomy
and the joy of writing from the heart. With deep
love and admiration, Sandy Stealy

8640M 11/12/ 0200-0500 | 10-F/SM4/ CN3 30m Miranda/
Comet P/Levy.

8642M 12/13/ 0400-0500 | 10-F/SM4/ CN3 1/Miranda/
CN3 -30m Comet P/Levy

These 3 mornings were very pleasant
and successful attempts at viewing
Comet Levy.

8643M 19/17/18 | 1-F/S. walk.

8644M 18/19 | 7-F/ general. 1 pm - 3 pm,
visitors - see next page.

To David,

Thank you so very much for your
kindness in showing me around your
fine observatory and home. Appreciate
your autographing your super
book "Observing Variable Stars"
Clear skies Gene Gale

8645EM Sat. 21/22 / 10²-F / JM4 / 1915-0200 / JM2, 3, 4,

PLevy plaque installation party - phase 2

I enjoyed seeing your
telescopes and the excellent work
you are getting

21 Sept 1991 Clyde w. Tombaugh

Jim Hunter

Michael Mager

~~Carol A. K.~~ 余昇天

Edna d. C. Strum

Patsy Tombaugh

I observed 3 other asteroids tonight - and it was even cloudy!

Gene Scott

8646S Monday 23 / 0745-1200 / 7-F / JM4 /

Miranda. Jim Scotti, then Clyde + Patsy

PLevy plaque installation party - finally plaque is
here.

8:00 am Jim.

10:40 am Clyde + Patsy

Enjoyed nailing on the comet
plate on your 16-inch telescope.
Sincerely, Clyde W. Tombaugh 23 Sept
1991

I'm so pleased we could help you
sell 120 copies of "Clyde Tombaugh" yesterday
at the interesting book store.
Patsy Tombaugh 9/25/91

- 8647E Friday 27 Sept / 2200-2300 / Steve Moran's house
Paul Feldman, Herb
- 8648E Saturday 28 Sept / 1900-2300 / 10-F / 15M4 /
Miranda / CN3 1h.
- 8649E Sunday 29 / 1900-2300 / 10-F / 15M4 / Miranda /
CN3 2h.
- 8650EM 30/31 / 1900-2300 int / road to Palomar
- 8651AN Oct 1/2 / 1800-0300 / 9-F (Pinatubo H₂SO₄) / CN3g
Palomar / 18" Schmidt / Genet, Carolyn
— Comet Shoemaker-Levy 1991z
discovered.
- 8652AN 2/3 / 1800-0400 / 9-F / Palomar / Shoemakers / CN3g
- 8653AN 3/4 / 1800-0500 / 9-F / " / " / CN3G. 1991z
- 8654AN 4/5 / 1850-0500 / 9-F / " / " / CN3G P/Levy
- 8655AN 5/6 / 1850-0500 / 10-F / " / " / CN3G P/Shoe T.
- 8656AN 6/7 / 1850-0500 / 10-F / ~~34~~ Palomar / Shoemakers /
CN3G 65 films!
- 8657AN 7/8 / 1850-0500 / 10-F / Palomar / Shoemaker-
Levy - new comet 1991a, Found and
rephotographed.

P/Bradfield 2
P/Brooks 2
P/Gehrels 3
P/Hartby 3
P/Helin-Roman-Alu 2
P/Kowal 2
P/Levy
P/Lovasz 2
P/Mueller 3
P/Neujman 3
P/Reinmuth 2
P/Russell 4 ←
P/Shoemaker 3
P/SW-3
P/Shoemaker-Holt 2
P/Shoemaker-Levy-5
P/Temple 2
P/Tsukashian 2
P/Wild 4 ←

8658 Thu 10/11/2000-2300/3-F/HH/31"

8658E Friday Oct 11/12/2000-2100/2-F/Hidden Hollow

8659E. Sat 12/13/2000-0200/3-F/HH/Steve Edberg,
Jon Kasper, Dave Hartsel, Jack Newton,
and Peter Sedick, and many others.

M 5 thru 31"

8661M Mon 14/15/0345-0430/10-F/JM4/Miranda
Venus + Jupiter in conjunction in east.
CN3 25^mE

8662M Tues 15/16/0430-0530/10-F/JM4/Miranda/
CN3 25^mE.

8663M Wed 16/17/0440-0530/10-F/JM3/Munira,

Miranda / CN3 0h 25^mE, suspect; galaxy,
but some stress during this session.

8664M. Thu 17/18/0440-0530/10-f/SM3/Minerva/1
CN3 0h 25^mE.

8665M Sat 19/20/0430-0520/3-f/SMF/Minerva/-1
CN3 0h 25^mE again.

8666E Sun 20/21/1900-2030/3-f/Clyde + Patsy's house/
Las Cruces / ~~GA~~ Jeff Saturn with 16", seeing
5-6. Some detail on N. belts.

Moon through Minerva.

How nice it was to observe
the fields of view thru your
Minerva telescope - a great comet
seeker. — Clyde W. Tombaugh

8667S. ATues 22/23/12:30-1:08/9-f/Las Cruces/

We are impressed by the comfort and convenience
of your Minerva telescope. You are set up to discover
anything from anywhere at any time! - Walter H. Haas

Minerva, so compact, so comfortable is a
complement to you David, comet seeker. To the
still unknown comet it says "Beware, I now can
find you elusive though you are!!" Peggy.

8668E Fri 25/26/1830-1930/10-f/SM3/
Minerva/-1 CN3 45^mW.

8669E Sat 26/27 Nov 1830-1945/10-F/Miranda CN3
1^h00^m W.

8670E Sun 27/28 1830-1945/~~10~~¹⁰F/SM4/Miranda/
CN3 1^h15^m W Comet hunting in west.

8671E Mon 28/29 1830-2102/3-F/SM4/Miranda/
CN3 1^h20^m W Comet hunting west

8672E Tues 29/30 1830-2302/3-F/SM4/Miranda/
CN3 1^h35^m W. Comet hunt west.

8673M ~~Thurs~~^{Wed 30/31} 0200-0330/1-F/SM4/-1.

8674S. Friday Nov. 1. Timothy Jenin. Good luck!
1630-1730/10-F/SMB, SM2, 3, 4

8675E2 2200-2302/10-F/ SM4/Timothy Ferris/
✓Miranda/M31, NGC 253, Stephan's quintet,
M1.

8676M3 0530-0555/~~10~~⁸-F/SM3/Minerva/-/
CN3 20^m E.

8677M Sat 2/3/0500-0530/10-F/SM4/
Minerva/CN3 15^m E.

8678A# Sun 3/4/1930-0530, int /10-F/SM3, 2, 4/
AN Ophelia, Miranda
CN3 1^h W, E.
3F Lt B Gem & ucm.

8679M. Mon 4/5/~~1800~~ 0300-0415/10-F/SM4/Miranda/-/
CN3 1^h E.

8680E. Tues 5/6/1830-1940/10-F/Pinal Air Park Rd/
-Munierwa / - / CN3 1^h West.

8681AN Wed 6/7/1830-0530 PST/10-F/ Palomar Mtn/
18" + Munierwa / G+C Shoemaker / CN3g: 58
films. CN3 10^m W, 15^m E.

8682AN Thurs 7/8/18:30-04:00 / 3-unf / Palomar mountain/
18" + Munierwa / Gene and Carolyn / passing
clouds interrupted some exposures.

8683AN Fri. 8/9/1830-05:30/3-F / Palomar / 18" +
Munierwa / Gene and Carolyn / better night.

8684AN Sat 9/10/1830-0430/3-F / Palomar / 18" +
Munierwa, / Gene + Carolyn / ~~h~~ We have
Comet Shoemaker-Levy 1991b, . Very nice,
fast moving, prograde.

I observed the new comet tonight through
Munierwa.

03:30 UT $M_1 = 12.7$ very difficult object.
Comet ~ 1' diam. $DC = 0$.

8685AN Sun 10/11/1830-~~19~~0515/1-then 10-F / Palomar /
18" + Munierwa / Gene + Carolyn / CN3G 31 films

8686AN Mon 11/12/1830-0515/10-F but a very strong NE
wind / CN3g 62 films 18" + Munierwa
CN3e N CrV C11.5
CN3 10^m E.

		x	y	
E	038928	-593.29	-927.97	
	038916	584.20	936.74	
	038911	581.90	943.84	
	038855	550.11	935.31	
	038901	577.02	926.38	
	038899	574.73	914.35	
	038921	586.70	897.58	
	038931	594.51	902.51	
	038942	603.91	907.46	
		581.26	921.50	trail
		581.33	921.84	

16 Nov UT 08 22.

46 min exp. 3AF plate
 very diffuse, trailed, extra fuzzy
 S edge of trail.

67 arc sec / mm.

trail is ~ 75" long

- *8687AN Tue, 12/13 / 1830-0508 / 7-10IF / Palomar /
 CN3g - films CN3 40m W, E, Took
 discovery films for P/Shoemaker - Levy 7. Possible
- 8688M Fri 15/16 / 0400-0600 / 10-F / J M 4 / Pos.
 CN3 - 40 min 332
 +4417
- 8689M Sat 16/17 / 0300-0600 / 10-F / J M 4 /
 CN3F - Leo. CN3e NGV > 14
- 8690M E Sun 17/18 / 1830-1908 / 7-fm / J M 3 / Muzerwa
 CN3 5mm RGB 6.9

8691M2. At. 0315-0600 / 10³-F / 3M2 / CN3F - Optelia /
Leo again CN3 Minerva 5min E.

8692M. Mon, Jan Nov 18/19 / ~~3~~ 7-fm / ~~5M3~~, 5MB + S.
walk / 0300-4000.

8693M EP Sun, Nov 24/25 / 1930-1940 / 7-F / Clyde's house,
Nov 25 ~~0 50.81~~ +22 21.2 } Las Cruces.

8694E, 25 0 51.29 +22 31.9 }
UT 26 0 53.69 + 23 24.1 } PIS-L6.
27 0 56.08 + 24 13.9 }

Mon 25/26 / 1900-2200 / 10-F / 3M3, 4 / CN3 30^mW.
P/Shoemaker-Lewy 6 with Miranda.

8695E Tues 26/27 / 1900-2300 / 10-F / 3M3, 4 / CN3 - 2^hW, abet E.
PIS-L6 with Minerva, # 02:50, UT MI=11.7.
BD=4' DC=0. Extremely diffuse coma.

8696M Wed 27/28 / 0300-0330 / 2-fm / S, walk.

8697E Thanksgiving Day / 1930-~~2100~~¹⁹³⁰ / 10-F / Rest area
W of Oakland / Minerva 1-1 one policeman.
CN3 15^mW.

8698EM Fri 29/30 / 02330-0100 / 10-3-F + gold / 18" + Minerva /
CN3g 5 films after clearing from snowstorm.

+8699AN Sat. 30/1, Dec / 10-F / Palomar / 18" + Minerva / - G+C
Shoemaker. CN3 5^mW, CN3g 50 films.

8700AN Dec 1/2/1800-0400/10-f-3/Palomar/18" + Minerva
= f G+C Shoemaker / CN3: 15min W, E, CN3G: 60
films.

8701AN 2/3/1800-0400/3-f/Palomar/18" + Minerva
G+C / 8 CN3g - some clouds.

8702AN 3/4/1800-0400/-some clouds.

8703AN 4/5/1800-0400/-some clouds

8704AN 5/6/1800-0600/nice night/3-f/Palomar
18" + Minerva / G+C / some clouds

8705AN 6/7/1800-1810/10-f/near Brewster, in desert/
Palomar / CN3 5min W.

87069E 7/8/2100-0000/9-f/Miranda/Rolf.
He did some comet hunting, and
then we observed M42.

8707S. 8/9/209:00-10:30/10-f/SM4/3,2/

examination of Miranda
Miranda
Ophelia -

18" + Minerva / 10-f-3 / 10-0000-0000 / 08 / 10 / 10:30:00

with Rolf and his friend Peter.

Palf Meier - nice visit + deep sky viewing!
-hope we can make it back soon

8708M. ^{late Blat} - impressive array of telescopes!
Dec 13/14 / 0100-0240 / 10-F15MB / - / Jim Scott
Geminids: 45 + 4 Monocerotids ↓

Dec 14 UT 12:55

Comet Shoemaker-Levy 1991d.

M₁ = 9.9 Coma 3' Faint tail toward NE.

(Miranda)

3+ 45 Geminids + 4 Monocerotids.

8708M2 Dec 13/14. ↑ / 0500-0600 / 10-F / 15M4.
Miranda 1-1 CN3: Comet Shoemaker-Levy
1991d.

8709M Dec 14/15 / 0300-0610 / 10-F / 15M4 / Miranda /
Comet Shoemaker-Levy again! Earlier,
14 Geminids

8711M Dec 15/16 / 0500-0600 / 10-F / 15M4 / Miranda / -1
Comet Shoemaker-Levy 1991d, breakfast.

Long cloudy spell.

8712E Dec 24/25 / ~~A~~ 1830-1855 / 32-F / JM4 /

Miranda.

Confirmed New Comet Z. ANOTTA - BREWINGTON as follows.

24.07639 2045 + A.5 (2000.0) M1=9

Only a brief confirmation through a gap in the clouds. Position uncertain.

8713E M Dec 27/25/26 / 04:45-0500 / 7-F / JM4 /

Miranda - / CN 3 5^m E. Moon too bright

8714E 26/27 / 18:15-18:30 / 10-F / JM3 / Mirerwa / CN 3 ^{at} 0^h05^m

8715E M Dec 26/27 / 05:15-06:15 / 7-F / Miranda /
- / CN 3 40^m E.

8716E Dec 27/28 / ~~05:15~~ 21:00-22:00 / 7-F / JM4 /

Miranda CN 3 30^m W.

8717 M Dec 28/29 / 0500-0600 / 10-F / JM4 / Miranda - /

CN 3e, CN 3 30^m NE.

8718 ~~A~~ ~~30/31~~ 29/30 / 1830-1840 A-F / w. of Grila Bend / Mirerwa (-) /
CN 3 5^m W.

8719AN 30/31 Dec 1800-0300/10-F but RH = 94-99.8%
CN3g/ Gene and Carolyn Shoemaker/ CN3G
40 films. one comet suspect focus, and one
for Jean Mueller.

8720AN 31/1 Dec 1991/1800-0400/10-3-f/18" + Miparval
Gene, Carolyn, and Jean/ CN3g, 44 films
Attempt to catch ocean of P/SW1 failed due to
clouds.

Log continued in Log 17.