

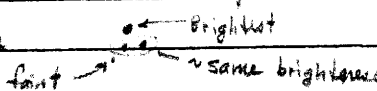
INDEX		LOG	
OBJECT	PERIOD - INSTRUMENT	NOTES	
M-57 Ring nebula	DATE 7-12-86 POWER 128 TYPE	TIME SEEING Fair INSTRUMENT	Impressive - Pointed Tealrad right on it
M-13 in Hercules	DATE POWER TYPE	TIME SEEING INSTRUMENT	Not very good - too much l.p.
M31	DATE 11-21-86 POWER 25 TYPE	TIME 8:00 SEEING Good INSTRUMENT	Very different - fills 1/2 field @ 70 mm
M32	DATE POWER TYPE	TIME SEEING INSTRUMENT	Bright nucleus - small surrounding nucleus
M103	DATE POWER 40 mm TYPE	TIME SEEING INSTRUMENT	Tried - Saw several stars that could have been part of a fine open cluster
M45	DATE POWER 40 TYPE	TIME SEEING INSTRUMENT	Very fine open cluster
M15	DATE POWER 20 TYPE	TIME SEEING INSTRUMENT	Very bright nucleus - stars faint but w/ averted vision can see GC covers a large area of field
M36	DATE POWER 40 TYPE	TIME SEEING INSTRUMENT	Several relatively bright (15-20) stars - Moderately compact open cluster
M37	DATE POWER 40 TYPE	TIME SEEING INSTRUMENT	Very faint - very large - great # of stars - fills field of view - 2 or 3 dominate stars - rest relatively faint
M38	DATE POWER 40 TYPE	TIME SEEING Dewing INSTRUMENT	Relatively bright stars - made out cross - 15 brighter stars Almost fills field of view
M42	DATE POWER 40 TYPE	TIME 9:00P SEEING INSTRUMENT	
M41 Canis Major	DATE 4-4-87 POWER 40 TYPE	TIME 8:00P SEEING Good INSTRUMENT	Many stars. One Red Star. Saw @ Astronomy Day ↑ Large, open cluster - Almost fills field of view

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OBJECT	PERIOD - INSTRUMENT	NOTES	
M42	DATE: 4-4-87 POWER: 40 TYPE: TIME: Sunset + SEEING: INSTRUMENT:	Red tint around edge - @ Sunset - had green tint to nebula - still very impressive, one of my favorites	
M51	DATE: 6-27-87 POWER: 20 TYPE: TIME: 9:30P SEEING: INSTRUMENT: Good	Could see companion. See some spiral structure w/ averted vision. Could not see bridge. Almost fill field of view. Impressive galaxy	
M104	DATE: 6-27-87 POWER: 20 TYPE: TIME: 10:00P SEEING: INSTRUMENT: Fair	Nice edge on galaxy. with averted vision could see dust lane. Medium surface brightness.	
M65 & M66	DATE: 6-27-87 POWER: 40 TYPE: TIME: 10:15P SEEING: INSTRUMENT: Fair	Could see both in same field of view.	
M65 & M66	DATE: 6-27-87 POWER: 20 TYPE: TIME: 10:20P SEEING: INSTRUMENT: Fair	Each galaxy had large angular displacement & relatively bright, but could not make out any details	
M55 - 6231 Leo	DATE: 6-27-87 POWER: 40 TYPE: TIME: 10:40P SEEING: INSTRUMENT: Fair	Large open cluster. Many bright, young stars. Swing scope through it to see it all.	
M53	DATE: 6-27-87 POWER: 40 TYPE: TIME: 11:00P SEEING: INSTRUMENT: Good	Bright nucleus, globular. Averted vision reveals many stars.	
M53	DATE: 6-27-87 POWER: 20 TYPE: TIME: 11:05P SEEING: INSTRUMENT: Good	Almost fills field of view. See prominent stars pop out. Seemed lopsided to one side (not symmetrical)	
M4	DATE: 6-27-87 POWER: 40-20 TYPE: TIME: 11:15P SEEING: INSTRUMENT: Good	Not compact Globular. Many members discernable. Dominated field of view, lopsided to east. @20 overfilled field. Very nice.	
M20	DATE: 6-27-87 POWER: 40-20 TYPE: TIME: 11:30P SEEING: INSTRUMENT: Good	Very compact globular. Bright nucleus & diffused halo. @20, could see members of globular w/ averted vision.	
M19	DATE: 6-27-87 POWER: 40-20 TYPE: TIME: 11:35P SEEING: INSTRUMENT: Good	Fair size @40. Good surface brightness. Could not see any member stars @ either power	
M62	DATE: 6-27-87 POWER: 40-20 TYPE: TIME: 11:40P SEEING: INSTRUMENT: Good	Very small @40 mm. Fairly faint. Could not see any member stars @ either power.	

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OBJECT	PERIOD - INSTRUMENT	NOTES	
M7	DATE: 6-27-87 POWER: 40 TYPE:	TIME: 11:50P SEEING: Good INSTRUMENT:	Large open cluster. Fills field of view. 15-30 members of same blue-white stars. No colored stars. Must be young. Very nice.
M6	DATE: 6-28-87 POWER: 40 TYPE:	TIME: 12:05A SEEING: Good INSTRUMENT:	open cluster, filled field of view. Faint set of stars. One star more yellow & brighter than rest which may be foreground star. 10 stars about same brightness, rest much fainter.
M57	DATE: 6-28-87 POWER: 40 TYPE:	TIME: 12:30A SEEING: Good INSTRUMENT:	hey, I like this one
M56	DATE: 6-28-87 POWER: 40-30 TYPE:	TIME: 12:45A SEEING: Good INSTRUMENT:	Small, very faint globular. Could not see members @ either power. Embedded in star rich field of Milky way.
M29 Cygnus	DATE: 6-28-87 POWER: 40 TYPE:	TIME: 1:00A SEEING: Good INSTRUMENT:	Open cluster Embedded in star rich field. Several members, all w/ same (blue-white) brightness
M39	DATE: 6-28-87 POWER: 40 TYPE:	TIME: 1:30A SEEING: Good INSTRUMENT:	Small open cluster. Best see in 40-30 filter. 10-15 fairly bright stars w/ 6 brighter ones. Embedded in star rich field. One bright star fills field @ 40. Easily seen member stars. @20 look right down in bright nucleus. Very impressive globular
M13	DATE: 6-28-87 POWER: 40-30 TYPE:	TIME: 1:40A SEEING: Good INSTRUMENT:	Small, but bright globular. @40 small angular disp. but can make out many member stars @20 can look down to bright nucleus w/ many member stars in orb. Seems to have a slight elliptical shape
M92	DATE: 6-28-87 POWER: 40-20 TYPE:	TIME: 2:00A SEEING: Good INSTRUMENT:	Very small globular. Embedded in star rich field. Low surface brightness. @20 could make out member stars. Still very small
M71	DATE: 6-28-87 POWER: 40-30 TYPE:	TIME: 2:15A SEEING: Good INSTRUMENT:	Saw 2 Draconids. 1 N→S, 2 S→N, 1 E→W. Very long tails & very bright. Saw next after midnight
Meteors	DATE: 6-28-87 POWER: TYPE:	TIME: SEEING: INSTRUMENT:	

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OBJECT	PERIOD - INSTRUMENT	NOTES	
	DATE POWER TYPE	TIME SEEING INSTRUMENT	
M5 Globular	9-19-87 40-20	9:45P Good	40 Small - Fairly bright nucleus see some stars 20 Nucleus brighter & can see many more stars
M107 Globular	9-19-87 40-20	9:54P Good	Very faint - hint of a glow - @20 brighten nucleus somewhat, but still very faint - Couldn't see any stars
M10 Globular	9-19-87 40-20	10:01P Good	40 Small See few stars of cluster - Best view @ 20 Dominated field - Nucleus fairly bright - See many stars of cluster
M12 Globular	9-19-87 40	10:04P Good	Little smaller than M10 - Good surface brightness see many stars of cluster - more diffused than others - lacks bright nucleus
M19 Globular	9-19-87 40-20	10:07P Good	Very faint glow in field - @20 make out bright nucleus & halo, but still very faint
M62 Globular	9-19-87 40	10:14P Good	Very faint - little glow - has bright nucleus (relative)
M9 Globular	9-19-87 20	10:19P Good	Brighter than M19-M62 - not much - can see bright nucleus & dim halo glow, no stars though
M14 Globular	9-19-87 40	10:24P Good	Fairly large, but uniform dim globular - no bright nucleus - could see ^{some} stars, but were dim
M23 Galactic Cluster	9-19-87 40	10:29P Good	Has several bright members - fills field of view
M20 & M21	9-19-87 40	10:37P Good	See dust w/ gas in M20 - large angular chip - same field w/ M21 - little cluster - M20 upper left - M21 lower right - M20 fairly faint -
M8	9-19-87 40	10:38P Good	Fairly faint - linear & flat - stretches across field - Could see M20, M21, & M8 in 8x50 finder
M16	9-19-87 40	10:54P Good	Faint gas cloud mixed w/ SS prominent, compact stars - nebula very faint

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OBJECT	PERIOD - INSTRUMENT	NOTES	
	DATE 9-19-87	TIME 10:56P	
	POWER 40	SEEING Good	
	TYPE	INSTRUMENT	
M17			Bright Bar of Gas extends 1/2 way across field w/ nebulosity streaming off 1 side
M18	DATE 9-19-87	TIME 10:55P	
	POWER 40	SEEING Good	
	TYPE	INSTRUMENT	
			Very small cluster of 12 stars - finder scope showed fuzziness, but field was hard to tell this was a cluster
M24	DATE 9-19-87	TIME 11:00P	
	POWER 40	SEEING Good	
	TYPE	INSTRUMENT	
			Very large galactic cluster - best seen in 8x50 - overwhelms field in scope
M25	DATE 9-19-87	TIME 11:03P	
	POWER 40	SEEING Good	
	TYPE	INSTRUMENT	
			Smaller & fills field of view - stars of many brightness - set of small bright stars make little coraborealis
M22	DATE 9-19-87	TIME 11:06	
	POWER 40-20	SEEING Good	
	TYPE	INSTRUMENT	
			Fairly large globular w/ uniform surface brightness can see a lot of the stars - 20 fills field of view & adds many stars
M28	DATE 9-19-87	TIME 11:12P	
	POWER 40	SEEING Good	
	TYPE	INSTRUMENT	
			Small fairly bright nucleus but overall dim
M69	DATE 9-19-87	TIME 11:22P	
	POWER 40	SEEING Fair	
	TYPE	INSTRUMENT	
			Very low in SW - very dim patch of light - hard to tell this is a globular
M70	DATE 9-19-87	TIME 11:23P	
	POWER 40	SEEING Fair	
	TYPE	INSTRUMENT	
			Little brighter, but dim overall very small
M54	DATE 9-19-87	TIME 11:24P	
	POWER 40	SEEING Good	
	TYPE	INSTRUMENT	
			Small globular w/ bright little nucleus - no stars discernable
M26	DATE 9-19-87	TIME 11:28P	
	POWER 40	SEEING Good	
	TYPE	INSTRUMENT	
Galactic Cluster			Very small - 3 brighter stars - 10 fainter stars Finder scope showed fuzziness
M11	DATE 9-19-87	TIME 11:30P	
	POWER 40	SEEING Good	
	TYPE	INSTRUMENT	
Cluster (Galactic)			Very faint - compact cluster - 3 bright field stars in front of approx 200 uniformly dim stars of the cluster - very fine
M55	DATE 9-19-87	TIME 11:34P	
	POWER 40-20	SEEING Good	
	TYPE	INSTRUMENT	
			Very large dim globular - can see many of the stars - uniform ^{bright} brightness - no nucleus - 20 fills 1/2 field fairly round - see many of the stars, but no bright nucleus

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OBJECT	PERIOD - INSTRUMENT	NOTES	
	DATE POWER TYPE	TIME SEEING INSTRUMENT	
M27 Dumbbell	9-19-87 40-70	11:42P Good	Very bright nebular - large - looks like picture @20 can see faint nebulosity that makes it look oval in nature (elongated)
M75	9-19-87 40-70	11:53P Good	Very small, bright globular - @20 see bright nucleus w/ dim halo - no stars
M31	9-20-87 40	12:12P Good	Fills field of view - bright nucleus - maybe saw dustlane breaking up one side of halo into possible spiral arms
M110 (possibly M32)	9-20-87 40	12:55P Good	Bright little fuzzy Elliptical - to away from M31 but still near
M2 Globular	9-20-87 40	12:29 Good	Fairly bright nucleus & diffused halo - Could see many of stars of cluster
M30 Globular	11-21-87 40	7:05 Fair-Good	32mm Faint Glow - @20mm Small - tight relatively bright nucleus - halo of stars seen - appears to have field stars in it
M72 Globular	11-21-87 20	7:20 Fair-Good	Small, faint uniform brightness halo globular. No stars discernable
M73 Stars	11-21-87 40	7:25 Good	40 mm faint & small - ~2 fields of view from M72. @20, easier to see faint → 
M15 Globular	11-21-87 40	7:38 Good	@40 Bright nucleus - can see halo of stars - @20 Fills 1/2 of field; Dominate bright nucleus; halo is very extensive; see many stars out to fringes of cluster
M57	11-21-87 40	7:45 Good	Like always - just remarkable
M32	11-21-87 40	7:49 Good	Bright nucleus with small visible halo - in same field w/ M31
M31	11-21-87 40	7:49 Good	Bright nucleus & diffused halo -

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OBJECT	PERIOD -	INSTRUMENT	NOTES
M110	DATE 11-21-87 POWER 40 TYPE	TIME 7:50 SEEING Good INSTRUMENT	large (fills ~1/2 of field) but uniformly dim - couldn't see any bright nucleus
M52	DATE 12-21-87 POWER 32mm TYPE	TIME 7:00 SEEING Fair - Good INSTRUMENT	Gal. Clus - 10-20 stars approx. same brightness - Prominent field star in cluster. Many more very faint members - Was fuzzy patch in 2x30 finder - fills 1/2 of field of view.
M103	DATE 12-21-87 POWER 32 TYPE	TIME 7:07 SEEING Fair - Good INSTRUMENT	(Cl 60) Small, compact group - Also fuzzy patch in finder. 4-5 Brighter stars w/ 1 reddish in color. Rest of stars fairly faint
M31, M32, M110	DATE 12-21-87 POWER 32 TYPE	TIME 7:45 SEEING Fair - Good INSTRUMENT	No dust lanes visible in M31. M32 has bright, little nucleus w/ small diffused halo - M110 dim. has uniform surface brightness
M33	DATE 12-21-87 POWER TYPE	TIME 8:06 SEEING Fair INSTRUMENT	@40 was a dim object w/ brighter nucleus - @32 halo almost fill field of view. Halo became spicules, possible dust lanes, but wasn't sure.
M74	DATE 12-21-87 POWER TYPE	TIME 8:15 SEEING Fair INSTRUMENT	Dim, small patch of light - @40mm, could not discern its shape - @32mm, galaxy could be circular
M76	DATE 12-21-87 POWER TYPE	TIME 8:28 SEEING Fair INSTRUMENT	@32 fairly bright - easy to see - @20mm its bigger but dim - looks like small Dumbell - no ring shape seen (planetary nebula)
M34	DATE 12-21-87 POWER 40 TYPE	TIME 8:43 SEEING Fair INSTRUMENT	(Gal Clus) Tight knot of stars in finder. Overwhelms field of view. There is a large separation of stars. Several bright members w/ several fainter ones
M77	DATE 12-21-87 POWER TYPE	TIME 8:55 SEEING Fair INSTRUMENT	@40 Bright nucleus, small halo - small object in field. @20 Can discern more halo - could be elliptical in shape, doesn't look circular
M42	DATE 12-21-87 POWER 32 TYPE	TIME 9:01 SEEING Fair INSTRUMENT	M42 had red & blue hues - very extended & filament nebula extending from center - could see dust lanes through nebula
M43	DATE 12-21-87 POWER 32 TYPE	TIME 9:02 SEEING Fair INSTRUMENT	Very faint, but could tell nebula divided w/ dust lanes - had star in center of nebula which could be the one illuminating it.
M42 & M43	DATE 2-13-88 POWER 32mm TYPE	TIME 7:10P SEEING Good INSTRUMENT	M42 Sprawling - could see reds & greens in nebula - M43 fainter, to 'open side' of M42 - has central star illuminating dim round nebulosity - seems to be divided into 3 sections by dust lanes

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OBJECT	PERIOD - INSTRUMENT	NOTES	
M33 Galaxy	DATE: 2-13-88 POWER: 32 TYPE: 32	TIME: 7:23 P SEEING: Better INSTRUMENT: 32	
		See it in finder scope - dim object w/ relatively brighter nucleus - w/ averted vision - can see spiral arms going CCW from nucleus - awesome galaxy - 40mm lens makes it bright.	
M74 Galaxy	DATE: 2-13-88 POWER: 32 TYPE: 32	TIME: 7:38 P SEEING: Better INSTRUMENT: 32	
		40mm - bright nucleus - not much contrast btw halo & nucleus - 32 can see a brighter nucleus fading into a uniform dim round halo	
M76 Pla. Neb.	DATE: 2-13-88 POWER: 32 TYPE: 32	TIME: 7:46 P SEEING: Better INSTRUMENT: 32	
		Looks like little dumbbell nebula - easily see in fov.	
M34 open cl.	DATE: 2-13-88 POWER: 32 TYPE: 32	TIME: 7:50 P SEEING: Better INSTRUMENT: 32	
		See w/ binocs & finder - tight knot of stars - fills fov @ 32 - several stars w/ varying magnitudes	
M77 Galaxy	DATE: 2-13-88 POWER: 32-20 TYPE: 32-20	TIME: 7:58 P SEEING: Better INSTRUMENT: 32-20	
		Small round galaxy - brighter nucleus that fades into dim halo - @ 1/2" diameter - @ 20 makes it 3x bigger - easily to see bright nucleus that fades uniformly into halo	
M79 Glob.	DATE: 2-13-88 POWER: 40-32-20 TYPE: 40-32-20	TIME: 8:05 P SEEING: Better INSTRUMENT: 40-32-20	
		40 - small & bright - neat object - can see pinpricks of individual stars - 32 makes it bigger - 20 gives best view - ^{fairly} bright fills 1/2 fov - see many member stars - w/ adv. vision see hundreds of stars that start in bright nucleus ^{ball} & fade out into fairly symmetrical halo - very neat object. far as small as it is	
M37	DATE: 2-13-88 POWER: 40 TYPE: 40	TIME: 8:14 P SEEING: Better INSTRUMENT: 40	
		Tight cluster in finder - embedded in a star rich field - many blue stars - 1 red (field star) appears in middle of cluster	
M36	DATE: 2-13-88 POWER: 40 TYPE: 40	TIME: 8:17 P SEEING: Better INSTRUMENT: 40	
		10-20 stars of approx same magnitude - rest of stars are dimmer compared to these	
M38	DATE: 2-13-88 POWER: 40 TYPE: 40	TIME: 8:40 P SEEING: Better INSTRUMENT: 40	
		Has many members w/ 10-20 stars approx same mag. & rest of dimmer magnitudes	
	DATE: POWER: TYPE:	TIME: SEEING: INSTRUMENT:	
		M37 most populated of 3 clusters in Auriga, & M36 is the dimmest as compared in finder - took long time to discern identities bec. couldn't get scope to point to zenith to see M38 easily	

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OBJECT	PERIOD	INSTRUMENT	NOTES
M1 - Crab Neb.	DATE	TIME	40mm. - elongated, uniformly lit nebulosity - moderately bright - oval in nature - 20mm is same size as M79 nice oval shape - couldn't see central star - uniform brightness over entire nebulosity
	2-13-88	8:49 P	
	POWER	SEEING	
	40 - 20	Great	
	TYPE	INSTRUMENT	
β Orionis - Rigel	DATE	TIME	Double - Bright Rigel w/ tiny blue companion - could see separation btw 2 stars
	2-13-88	7:00 P	
	POWER	SEEING	
	40		
	TYPE	INSTRUMENT	
M78 nebula	DATE	TIME	fan shape - cutoff on one side - has a definite border - nebula 'fans' away from border - has 2 stars embedded in it - rather dim nebula - 20mm loses contrast
	2-13-88	9:00 P	
	POWER	SEEING	
	40 - 20		
	TYPE	INSTRUMENT	
ζ Orionis Multiple star	DATE	TIME	Saw 2 blue stars + yellow - large angular separation btw these stars - suppose to be a white companion - couldn't tell which one this was suppose to be
	2-13-88		
	POWER	SEEING	
	40		
	TYPE	INSTRUMENT	
ε Orionis - bottom star of sword	DATE	TIME	suppose to be white, lt. green, purple - Purple very small A faint very close to larger white one - hard to tell lt. green - was little farther from these 2.
	2-13-88		
	POWER	SEEING	
	40		
	TYPE	INSTRUMENT	
M35	DATE	TIME	overwhelms fov. - card says 120 members which is probably true - 9-10 ^{little} redder stars embedded in cluster - varying mag. of blue stars compose rest of cluster.
	2-13-88	9:22 P	
	POWER	SEEING	
	40		
	TYPE	INSTRUMENT	
IC 2158	DATE	TIME	Nearby M35 - faint nebulosity - card says cluster of 40 stars, but looked like nebula than cluster - w/ adv. vision - could tell stars - makes a little 'fan' shaped cluster that opens away from M35
	2-13-88	9:23 P	
	POWER	SEEING	
	40		
	TYPE	INSTRUMENT	
NGC 2023 and/or NGC 2024	DATE	TIME	Faint Nebulosity East of ζ Orionis - cut across middle w/ large dust lane - each piece was broken w/ more dust lanes - ζ Orionis had halo where star lights up ^{gas}
	2-13-88	9:28	
	POWER	SEEING	
	40		
	TYPE	INSTRUMENT	
M41 op.c1.	DATE	TIME	5-7 stars had redder color - fill fov - rest of members (50) had varying mags.
	2-13-88	9:40 P	
	POWER	SEEING	
	40		
	TYPE	INSTRUMENT	
M50	DATE	TIME	Cluster of 100 stars - hard to tell this - 1 red star in field - 5-10 brighter stars & rest very faint - doesn't quite fill fov
	2-13-88	9:43 P	
	POWER	SEEING	
	40		
	TYPE	INSTRUMENT	

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OBJECT	PERIOD - INSTRUMENT	NOTES	
	DATE	TIME	
	POWER	SEEING	
	TYPE	INSTRUMENT	
M93 Clus	2-13-88	9:48P	
	40		
	DATE	TIME	
	POWER	SEEING	
	TYPE	INSTRUMENT	
M46 Cluster	2-13-88	9:56P	
	40		
	DATE	TIME	
	POWER	SEEING	
	TYPE	INSTRUMENT	
NGC 2438	2-13-88	9:57P	
	20		
	DATE	TIME	
	POWER	SEEING	
	TYPE	INSTRUMENT	
M47 Cluster	2-13-88	10:00P	
	40	Great	
	DATE	TIME	
	POWER	SEEING	
	TYPE	INSTRUMENT	
M48 Gal. Clus. (80 stars)	2-13-88	10:07P	
	40		
	DATE	TIME	
	POWER	SEEING	
	TYPE	INSTRUMENT	
M44 Beehive	2-13-88	10:08P	
	40		
	DATE	TIME	
	POWER	SEEING	
	TYPE	INSTRUMENT	
M67 Cluster	2-13-88	10:14P	
	40		
	DATE	TIME	
	POWER	SEEING	
	TYPE	INSTRUMENT	
Venus, Jupiter	3-12-88	7:55P	
		Fair - Windy	
		w/ Jennifer	
	DATE	TIME	
	POWER	SEEING	
	TYPE	INSTRUMENT	
NGC 2392	3-12-88	8:25P	
	40 - 20mm	Fair Windy	
	DATE	TIME	
	POWER	SEEING	
	TYPE	INSTRUMENT	
	DATE	TIME	
	POWER	SEEING	
	TYPE	INSTRUMENT	
	DATE	TIME	
	POWER	SEEING	
	TYPE	INSTRUMENT	

2 red stars in field - small compact cluster - most stars pretty faint - in finder, fuzzy patch of light

150 members - overwhelms fov - very nice circular symm. overall varying magnitudes fade away to edges - has embedded fuzzy patch of light

Planetary Nebula in M46 - could see ring - size & shape of M57 @ 40mm - maybe have smaller - very nice surprise - had to see what this was bfr moving on -

10 stars about same mag. that dominate - fills fov. - loose assoc. of stars - rest of stars are various mags.





Open expanse of stars - elongated cluster that overwhelms fov.

like M45 - best view is in finder - see it w/ naked eye. many bright blue stars - nice

Tight little cluster - fill 1/2 fov - one bright field star - rest of members are moderately bright to dim - kind of circular in nature

1/2 disc on Venus - Jupiter had 4 moons in row - could see 2 faint stars near w/ one in 4 moon line


40 - looked like out of focus star - 20mm gives best view - circular, uniformly lit (like M3) - no ring shape seen - w/ adequate vision can easily see central star - spectacular

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OBJECT	PERIOD - INSTRUMENT	NOTES	
Start Wed. Night	DATE 5-12-88	TIME	TSP '88 - Skies PC til Midnight - Cleared East to West w/ clouds low in North - by 2:30A, clouded over from west - light breeze - cool night - seeing very good
	POWER	SEEING	
	TYPE	INSTRUMENT	
M81	DATE 5-12-88	TIME 12:21	40 - Oval, bright Nucleus, diffused halo - @20mm - Oval shaped, Nucleus dominate over diffused halo - fills FOV end-to-end @ this power
	POWER 40-20	SEEING	
	TYPE	INSTRUMENT	
M82	DATE 5-12-88	TIME 12:23	@40mm - linear shaped (igar) - w/adv. vision, saw a dust line going horizontal  - @20mm  could see 2 verticle dust lanes w/ adv. vision stretching 3/4 way across FOV
	POWER 40-20	SEEING	
	TYPE	INSTRUMENT	
	DATE	TIME	Could see both M81 & M82 in BSCD map - but not in my FOV @ 40mm
	POWER	SEEING	
	TYPE	INSTRUMENT	
M105, NGC 3384	DATE 5-12-88	TIME 12:46	Initially found this & thought it was M95, but - but w/ patience, I located & identified this one while panning the area, saw several kind masses of galaxies, some circular, some linear. @40mm - has bright nucleus, & small diffused halo looks circular - 3384 looks like M105 except a noticeably bit smaller - End galaxy, was very faint, w/ adv. vision looked irregular in shape, not symmetric - hard to tell how it was so faint
	POWER 40-20	SEEING	
	TYPE	INSTRUMENT	
	DATE	TIME	M105  3384  - all 3 in FOV - they fit nicely - @20mm - all 3 still in FOV - M105 & 3384 brighter, but still looked the same - looked irregular & still very faint
	POWER	SEEING	
	TYPE	INSTRUMENT	
M96	DATE 5-12-88	TIME	little over 40mm FOV away from M105 was M96 - @40mm looked oval, rel. brighter nucleus & diffused ^{diffused} halo - @20mm made it larger, still looked oval
	POWER 40-20	SEEING	
	TYPE	INSTRUMENT	
M95	DATE 5-12-88	TIME	little over 40mm FOV away from M96 was M95 - 40mm fainter than 105 or 96 - nucleus not as dominate, but was brighter than halo - @20mm look kind of elongated (oval to linear shape) - nucleus easier to see
	POWER	SEEING	
	TYPE	INSTRUMENT	

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OBJECT	PERIOD	INSTRUMENT	NOTES
M108	DATE 5-12-88	TIME 1:05A	elongated, oval galaxy w/ starlike point nucleus (could have been foreground star, then no nucleus present - uniformly lit galaxy) - @20mm larger, still has the starlike nucleus
	POWER 40-20	SEEING	
	TYPE	INSTRUMENT	
	DATE	TIME	
	POWER	SEEING	
	TYPE	INSTRUMENT	
M97 Pl. Nb.	DATE 5-12-89	TIME 1:06A	Round, 1.1Hr larger than M57 - No central star seen - uniform brightness over entire surface - 20mm makes it larger but uncovers no further details
	POWER 40-20	SEEING	
	TYPE	INSTRUMENT	
	DATE	TIME	
	POWER	SEEING	
	TYPE	INSTRUMENT	
M40 Dbl. star	DATE 5-12-88	TIME 1:12A	1 star little brighter than other - confirmed by matching stars on finder card to those in 7x50
	POWER 40	SEEING	
	TYPE	INSTRUMENT	
	DATE	TIME	
	POWER	SEEING	
	TYPE	INSTRUMENT	
M109	DATE 5-12-88	TIME 1:17A	Faint Gal. @40mm appears oval & long - has faint field stars - @20mm, galaxy has uniform brightness w/ 3-4 faint field stars in it - (they could be a nucleus)
	POWER 40-20	SEEING	
	TYPE	INSTRUMENT	
	DATE	TIME	
	POWER	SEEING	
	TYPE	INSTRUMENT	
NGC 5139	DATE 5-12-88	TIME 1:25A	Many stars - over FOV - fairly round, uniformly lit - looks like planet
	POWER 40	SEEING	
	TYPE	INSTRUMENT	
	DATE	TIME	
	POWER	SEEING	
	TYPE	INSTRUMENT	
NGC 5128	DATE 5-12-88	TIME 1:28A	Saw dust lane - fill 1/2 FOV in length - top (E) lobe brighter than N - faint field star centered in S. lobe - very faint star in W edge of dust lane
	POWER 40	SEEING	
	TYPE	INSTRUMENT	
	DATE	TIME	
	POWER	SEEING	
	TYPE	INSTRUMENT	
M51 NGC 5195	DATE 5-12-88	TIME 1:40A	nice - bright swirls - tight spiral - 5195 @ same brightness as M51 - @20mm nice spiral originating from uniform light nucleus & winding almost 1/2 turn around - 5195 has same nucleus brightness as M51 & has extended halo that is lopsided away from bridge - couldn't see bridge
	POWER 40-20	SEEING	
	TYPE	INSTRUMENT	
	DATE	TIME	
	POWER	SEEING	
	TYPE	INSTRUMENT	
M57	DATE 5-12-88	TIME 1:48A	Nice - had red tint to it
	POWER 40	SEEING	
	TYPE	INSTRUMENT	
	DATE	TIME	
	POWER	SEEING	
	TYPE	INSTRUMENT	
	DATE	TIME	Saw 10+ meteors from Eta Aquina shower - some short & fast, 2 in 5 very bright & slow
	POWER	SEEING	
	TYPE	INSTRUMENT	
	DATE	TIME	

INDEX		LOG	
OBJECT	PERIOD - INSTRUMENT	NOTES	
Venus	DATE: 5-12-88 TIME: 8:40P	Venus - 1/4 crescent - clear skies - light winds -	
Start Thursday Night	POWER: 40 SEEING: TYPE: INSTRUMENT:	comfortable temp	
Mercury	DATE: 5-12-88 TIME: POWER: 40 SEEING: TYPE: INSTRUMENT:	Tomorrow night max elongation - well over 1/2 full - could see heat waves from earth distant image	
Comet Liller	DATE: 5-12-88 TIME: 10:09P POWER: 40 SEEING: TYPE: Newtonian INSTRUMENT: 10" f/5	Bright nucleus, lot of halo around it - tail sweep away clean out of FOV - w/ head @ edge of field, tail sweeps clear across field	
M65, M66, NGC 3628	DATE: 5-12-88 TIME: 10:12P POWER: 40-20 SEEING: Good TYPE: INSTRUMENT:	M66 - edge on galaxy, brighter central buldge, not dominating though - brightens from edge to buldge uniformly M65 - looks more oval - face on possible - halo brightness uniform to nucleus - both 65 & 66 fit in 40mm FOV NGC 3628 - long & flat, possible edge on - much fainter than M65 or M66 - M66 brighter than M65 - 3628 very faint overall - @ 20mm shows M66 tilted, not edge on - see nucleus better - fill 2/3 FOV - M65 fills 1/2 FOV - verifies its oval & again brings nucleus out better - 3628 can see some tilt to galaxy - w/ adv. vision you can tell a rel. brighter nucleus area - appear slightly elongated, but no dominate nucleus present - could see a possible dust lane separating elongated brighter area from a very faint part	
M61	DATE: 5-12-88 TIME: 10:36P POWER: 20-40 SEEING: Great TYPE: INSTRUMENT:	has pin-point star-like nucleus - round - uniformly lit except for nucleus - 2 faint field stars (3) of nucleus - 1 very faint on other side - dominates FOV - @ 40mm, round fuzzy - very faint - small - 1/2 size of M57 - w/ adv. vision, can see star like nucleus	
M49	DATE: 5-12-88 TIME: 11:15P POWER: 40-20 SEEING: TYPE: INSTRUMENT:	Took long time to find & verify bca. of all other gal. in area - @ 40mm - brighter nucleus w/ something near it that could be star - like 2 nucleus - fairly bright - @ 20mm best view - verify 2nd object is field star - nucleus quite large, halo disappears quickly from nucleus - not much halo - round in shape - description in Messier catalogue helped find this object	

INDEX	LOG		
OBJECT	PERIOD	INSTRUMENT	NOTES
M60	DATE 5-12-88	TIME 11:23P	little brighter than M59 @40mm M60 & M59 in same field - @20mm - round
NGC 4647	POWER 40-20	SEEING Excellent	faint galaxy - fairly small in FOV - rel brighter nucleus
	TYPE	INSTRUMENT	dominates object - 4647 faint fuzzy near M60 in
	DATE	TIME	same FOV - relatively separation btw. 2 - @40mm
	POWER	SEEING	could see M60 & 4647 as 2 separate nuclei
	TYPE	INSTRUMENT	@20mm 4647 not uniformly lit - w/ adv. vision, can
	DATE	TIME	tell brighter nucleus area present - 1/4 size of M60 -
	POWER	SEEING	very faint - appears to have an extended halo
	TYPE	INSTRUMENT	
Misc	DATE	TIME	looking through this area, many faint fuzzies,
	POWER	SEEING	edge on spirals, 1 round one
	TYPE	INSTRUMENT	
M59	DATE 5-12-88	TIME 11:25P	adv. vision, has point starlike nucleus - 1/2 size of M60 -
	POWER	SEEING	has extended halo area away from nucleus
	TYPE	INSTRUMENT	
M58	DATE 5-12-88	TIME 11:30P	Small, faint, round fuzzy w/ rel. brighter middle -
	POWER 40-20	SEEING	@20mm pretty small, brighter nucleus dominates
	TYPE	INSTRUMENT	object - not much halo area of large nucleus - halo
	DATE	TIME	faint -
	POWER	SEEING	
	TYPE	INSTRUMENT	
M79	DATE 5-12-88	TIME 11:41P	Used instr. in book to go from M58 → M79 - small
	POWER 40-20	SEEING Excellent	nucleus, almost starlike embedded in fuzzy halo -
	TYPE	INSTRUMENT	@20mm very small galaxy - bright nucleus, not large
	DATE	TIME	w/very faint halo around - still a small object
	POWER	SEEING	
	TYPE	INSTRUMENT	
M90	DATE 5-12-88	TIME 11:47P	follow instr. 1° N, little east → M90 - elongated oval,
Galaxy	POWER 40-20	SEEING	starlike nucleus → @20mm fills < 1/4 FOV - tell its tilted
	TYPE	INSTRUMENT	a bit (not edge on) - very faint - w/adv. vision see starlike
	DATE	TIME	nucleus
	POWER	SEEING	
	TYPE	INSTRUMENT	
M97	DATE 5-12-88	TIME 11:53P	From M58 2° → Double to M97 - verified by triangulating M58 &
	POWER 40-20	SEEING	M97 - @40mm - very small - bright nucleus w/ small halo -
	TYPE	INSTRUMENT	almost uniformly lit - 2 other small galaxies in FOV -
	DATE	TIME	small starlike nuclei w/ fuzzy around them - @20
	POWER	SEEING	made gal diffused, spread out nucleus - tell nucleus
	TYPE	INSTRUMENT	there too its little brighter, but not dominating
			object.

INDEX	LOG		
OBJECT	PERIOD	INSTRUMENT	NOTES
M84, M86	DATE 5-12-88	TIME 11:56P	continue 2° more & find objects - @40mm FOV shows 4 gal. - other two linear ^{faint} streaks of light - M84 small, rel. bright nucleus that fades off to halo - M86 same as M84 but halo here smaller than M84 - @20mm shows more of same - brighter nucleus fading into halo - saw sth very faint galaxy not on line btw M84 & M86, but a little to the right (E) - very faint fuzzy -
	POWER 40-20	SEEING	
	TYPE	INSTRUMENT	
Meteor Shower	DATE	TIME	Very fabulous show of meteors - had 3 go thru FOV while I was looking @ objects - very fast point of light streaked thru FOV
	POWER	SEEING	
	TYPE	INSTRUMENT	
M99	DATE 5-12-88	TIME 12:13A	Round, faint galaxy - not bright nucleus, but brighter than halo - @20mm - smears out light - light brighter from halo ^{faint} to nucleus, but nucleus not dominating - looks circular - w/ add. ^{rel. brighter} could be elongated oval
	POWER 40-20	SEEING Excellent	
	TYPE	INSTRUMENT	
M98	DATE 5-13-88	TIME 12:19A	tilted gal. - see little ball of nucleus & oval halo around it - @20mm - fill 1/2 FOV - nucleus brighter - almost edge on - can see halo on both sides of nucleus not much though - 
	POWER 40-20	SEEING Excellent	
	TYPE	INSTRUMENT	
M100	DATE 5-13-88	TIME 12:33A	Rt Telred on it - very faint, small gal - brighter area in middle (nucleus) but not dominating - circular - one of those meteors crossed FOV (2nd one of night) - point of light just goes 'STREAK' and its gone
	POWER 40-20	SEEING	
	TYPE	INSTRUMENT	
M106	DATE 5-13-88	TIME 11:54	Rel. bright - oval in nature - could be nice spiral w/ 20° tilt towards us - nucleus is small part of extended object - @20mm gives good view - fill 1/2 FOV - ^{little} nucleus is little brighter than oval halo - halo dominates this galaxy - lots of other galaxies in this area
	POWER 40-20	SEEING	
	TYPE	INSTRUMENT	

INDEX	LOG		
OBJECT	PERIOD -	INSTRUMENT	NOTES
M68	DATE 5-13-88	TIME 1:30A	@40mm very small. - has field stars with it -
Glob. Clus.	POWER 40-20	SEEING Excellent	hard to see member stars - @20mm - fills 1/2 FOV -
	TYPE	INSTRUMENT	fairly round - w/adv. vision can see member stars -
	DATE	TIME	more you look, the more stars you see - nicely fills
	POWER	SEEING	center of FOV - pretty uniformly lit - nice globular -
	TYPE	INSTRUMENT	some stars that might appear as field stars could be
	DATE	TIME	part of cluster
	POWER	SEEING	
	TYPE	INSTRUMENT	
M104	DATE 5-13-88	TIME 1:40A	@40mm - see central bulge then thin out into
	POWER 40-20	SEEING	arms - see dust lane - @20mm - Northern part
	TYPE	INSTRUMENT	has brighter of gal. & bulge & other side of
	DATE	TIME	dissecting dust lane is very faint - just a hint of
	POWER	SEEING	light - nucleus pretty bright & uniformly dim (slightly)
	TYPE	INSTRUMENT	out to arms
	DATE	TIME	
	POWER	SEEING	
	TYPE	INSTRUMENT	
M63 Gal	DATE 5-13-88	TIME 1:48A	Very dim - nucleus dim & very faint halo - elongated
Canes Venatici	POWER 40-20	SEEING	oval - best view @40mm while 20mm shows ^{definite}
	TYPE	INSTRUMENT	oval shape
	DATE	TIME	
	POWER	SEEING	
	TYPE	INSTRUMENT	
M74 Gal	DATE 5-13-88	TIME 1:52A	@40 - small round fuzzy - @20mm - looks round -
Canes Venatici	POWER 40-20	SEEING	small, bright dominating nucleus w/ very small
	TYPE	INSTRUMENT	faint halo around it
	DATE	TIME	
	POWER	SEEING	
	TYPE	INSTRUMENT	
M53	DATE	TIME 1:58A	@40mm - small, easily seen in FOV - w/adv. vision,
Glob. Clus.	POWER	SEEING	you can tell its speckled - @20mm - good view -
Canes Venatici	TYPE	INSTRUMENT	dominates center of FOV - w/adv. vision can see
	DATE	TIME	many, many stars around edge of Gl. but can't
	POWER	SEEING	resolve uniform brightness of nucleus - has stars
	TYPE	INSTRUMENT	over top of nucleus, but you can't look down
	DATE	TIME	into nucleus like w/ other glob. clusters - stars
	POWER	SEEING	@ edge are tiny, faint pin-points of light
	TYPE	INSTRUMENT	
	DATE	TIME	
	POWER	SEEING	
	TYPE	INSTRUMENT	
M64	DATE 5-13-88	TIME 2:05A	Gal. tilted towards us - oval in nature - small, round
Black-eye nebula	POWER 40-20	SEEING	bright nucleus - halo is uniformly lit & bright - @20mm
	TYPE	INSTRUMENT	dimmed it a bit - w/adv. vision see dust lane on
	DATE	TIME	other (back) side of bright nucleus ball - went &
	POWER	SEEING	away around back of it - Like this object - fill 1/2 FOV.
	TYPE	INSTRUMENT	

← search from memory

INDEX	LOG		
OBJECT	PERIOD -	INSTRUMENT	NOTES
M83	DATE	TIME	Face-on Gal. - not bright but easy to see - fills 1/2 FOV - has brighter nucleus, and large uniformly lit halo - @20mm brought image to fill FOV - small ^(tiny) bright nucleus - w/ adv. vision, could see a hint of arms going in ccw direction - light spiral - saw at least 2 places where halo darkened just a bit which (this was on right side of nucleus) could have been the separations
	5-13-88	2:15A	
	POWER	SEEING	
	40-30		
Saturn	DATE	TIME	looked good - could see 6-8 moons - many were very faint points of light
	5-13-88	3:45A	
	POWER	SEEING	
	40-20		
Uranus	DATE	TIME	couldn't find
	5-13-88		
	POWER	SEEING	
	40-20		
Mars	DATE	TIME	too low, heat from earth breaking up image
	5-13-88	3:51A	
	POWER	SEEING	
	40-20		
Start Friday Night	DATE	TIME	nebulae seemed to have almost disappeared whereas earlier they were plentiful - Milky Way just gorgeous - stretching overhead - Sagittarius area all white -
	5-13-88		
	POWER	SEEING	
	40-20		
M13	DATE	TIME	Fantastic as always - lots of stars
	5-13-88	10:12P	
	POWER	SEEING	
	20mm		
M51	DATE	TIME	Just like before - swirling arms - nice.
	5-13-88	10:19P	
	POWER	SEEING	
	20		
M97	DATE	TIME	Looking for eyes - look at it, look w/adv. vision can plainly see them - 2 rel large darker areas of nebula - Fantastic view
	5-13-88	10:23P	
	POWER	SEEING	
	20	Great	

INDEX	LOG		
OBJECT	PERIOD - INSTRUMENT	NOTES	
M91	DATE	TIME	
	5-12-88	11:33P	
	POWER	SEEING	
	40-20		
	TYPE INSTRUMENT		
	DATE	TIME	
	POWER	SEEING	
	TYPE INSTRUMENT		
	DATE	TIME	
	POWER	SEEING	
	TYPE INSTRUMENT		
	DATE	TIME	
	POWER	SEEING	
	TYPE INSTRUMENT		
M88	DATE	TIME	
	5-13-88	11:44P	
	POWER	SEEING	
	40-20	excellent	
	TYPE INSTRUMENT		
	DATE	TIME	
	POWER	SEEING	
	TYPE INSTRUMENT		
	DATE	TIME	
	POWER	SEEING	
	TYPE INSTRUMENT		
M64	DATE	TIME	
	5-14-88	12:00A	
	POWER	SEEING	
	20	Excellent	
	TYPE INSTRUMENT		
	DATE	TIME	
	POWER	SEEING	
	TYPE INSTRUMENT		
M101	DATE	TIME	
	5-14-88	12:09A	
	POWER	SEEING	
	40-20		
	TYPE INSTRUMENT		
	DATE	TIME	
	POWER	SEEING	
	TYPE INSTRUMENT		
	DATE	TIME	
	POWER	SEEING	
	TYPE INSTRUMENT		
M102	DATE	TIME	
	5-14-88	12:34A	
	POWER	SEEING	
	40-20		
	TYPE INSTRUMENT		
	DATE	TIME	
	POWER	SEEING	
	TYPE INSTRUMENT		
NGC 5907	DATE	TIME	
	5-14-88	12:36A	
	POWER	SEEING	
	40-20		
	TYPE INSTRUMENT		
	DATE	TIME	
	POWER	SEEING	
	TYPE INSTRUMENT		
M85	DATE	TIME	
	5-14-88	1:37A	
	POWER	SEEING	
	40-20		
	TYPE INSTRUMENT		

also large, not dominating nucleus - very round 'ball' shaped - object still small in FOV though

INDEX		LOG	
OBJECT	PERIOD - INSTRUMENT	NOTES	
M3	DATE 5-14-88	TIME 11:44P	could see many stars - nucleus not large, but halo stars extended way out from nucleus - not a high concentration though - like a few stars - @20mm fills FOV - see stars speckled over nucleus & around edge - stars were of varying sizes
	POWER 40-20	SEEING Excellant	
	TYPE	INSTRUMENT	
Meteor Shower	DATE	TIME	Count down - meteors short
	POWER	SEEING	
	TYPE	INSTRUMENT	
Uranus	DATE 5-14-88	TIME	Green color - could tell it was a disc Pretty - 1st time I've seen this in a scope
	POWER 20	SEEING	
	TYPE	INSTRUMENT	
Saturday Night Atoka Observing Site	DATE 6-11-88	TIME	Clear, warm @ sunset, cooled off later on - became damp; bit of dew - saw meteor across finder scope when aligning it w/ main scope
	POWER	SEEING	
	TYPE	INSTRUMENT	
NGC 3226-3227	DATE 6-11-88	TIME 10:45P	@40mm - small, dim - side by side in both fields - looked like out-of-focus stars - @20mm distinct, very faint galaxies - rel. bright ^{int} nucleus w/ hint of halo around them separated 1/2 fov -
	POWER	SEEING Good	
	TYPE	INSTRUMENT	
NGC 3190-3193	DATE 6-11-88	TIME 10:55	Verified objects by field stars on finder cards - Suppose to have 3187 btw them, but I couldn't see it - 3193 ^{was} near a star - small, very faint; can see nucleus - 3190 is slightly elongated (linear) shape - in same fov as 3193 - 40mm shows this linear shape - 3193 little brighter than 3190, but both still very faint
	POWER 20mm	SEEING Good	
	TYPE	INSTRUMENT	
NGC 3310	DATE 6-12-88	TIME 12:01A	@40mm looked like oof star - @20mm small, circular in shape - very faint w/ uniform brightness - situated near bright field star - brighter than 3190 & 3193
	POWER	SEEING Great	
	TYPE	INSTRUMENT	
NGC 5634 Globular	DATE 6-12-88	TIME 11:03A	@40mm small fuzzy object nestled w/ 2 brighter field stars (see drawing) - @20mm see bright nucleus blend into ^{stars} halo - very small -
	POWER	SEEING	
	TYPE	INSTRUMENT	
NGC 5694 Glob. in Hydra One of the most distant	DATE 6-12-88	TIME 11:21A	@40mm - looked like oof star (see picture) @20mm - small, faint w/ very little brighter nucleus - looked like M13 in 8x50 finder - almost uniform brightness though - could tell it had a little halo
	POWER	SEEING	
	TYPE	INSTRUMENT	

