

Chart 17													
Name	M	Const.	Mag.	Type	Size	R.A.	Decl.	C	R	S	O	# Stars	B
Common					Notes								
Cr 464		CAM	4.2	OC	120m	5h 22.0m	73° 00.0'					50	
NGC 1961		CAM	11.0	GAL	4.5m x 3.1m	5h 42.1m	69° 23.0'						
					cF,pL,iF,mbM,er,* inv - H III 747;hexagonal;2 branch arms w some knots								
NGC 2146		CAM	10.6	GAL	5.7m x 3.3m	6h 18.6m	78° 21.0'				O		
					pB,2l,IE - extreme broad spiral arms;2 main smooth arms;1 w dark lane								
NGC 2300		CEP	11.0	GAL	3.5m x 2.4m	7h 32.3m	85° 43.0'						
					pB,pL,IE,bM - Pair with NGC 2276 at 6' and IC 1455 at 10'; vsBN								
NGC 2336		CAM	10.4	GAL	6.8m x 3.7m	7h 27.1m	80° 11.0'						
					pB,pL,R,2*11 nr - weak bar;many weak filam arms w knots; P w IC 467								
NGC 2403		CAM	8.5	GAL	23.4m x 11.8m	7h 36.8m	65° 36.0'	C7	R37	S10	O		B
					!! cB,eL,vmE,vgmbMN - H V 44;in M81 group;many well res irreg arms;broad bar								
NGC 2655		CAM	10.1	GAL	4.9m x 4.1m	8h 55.6m	78° 13.0'		R38	S11	O		
					vB,cL,IE 90,gsymbM,diff - H I 288;large nucleus w asym dk matter in lens;faint outer whirls								

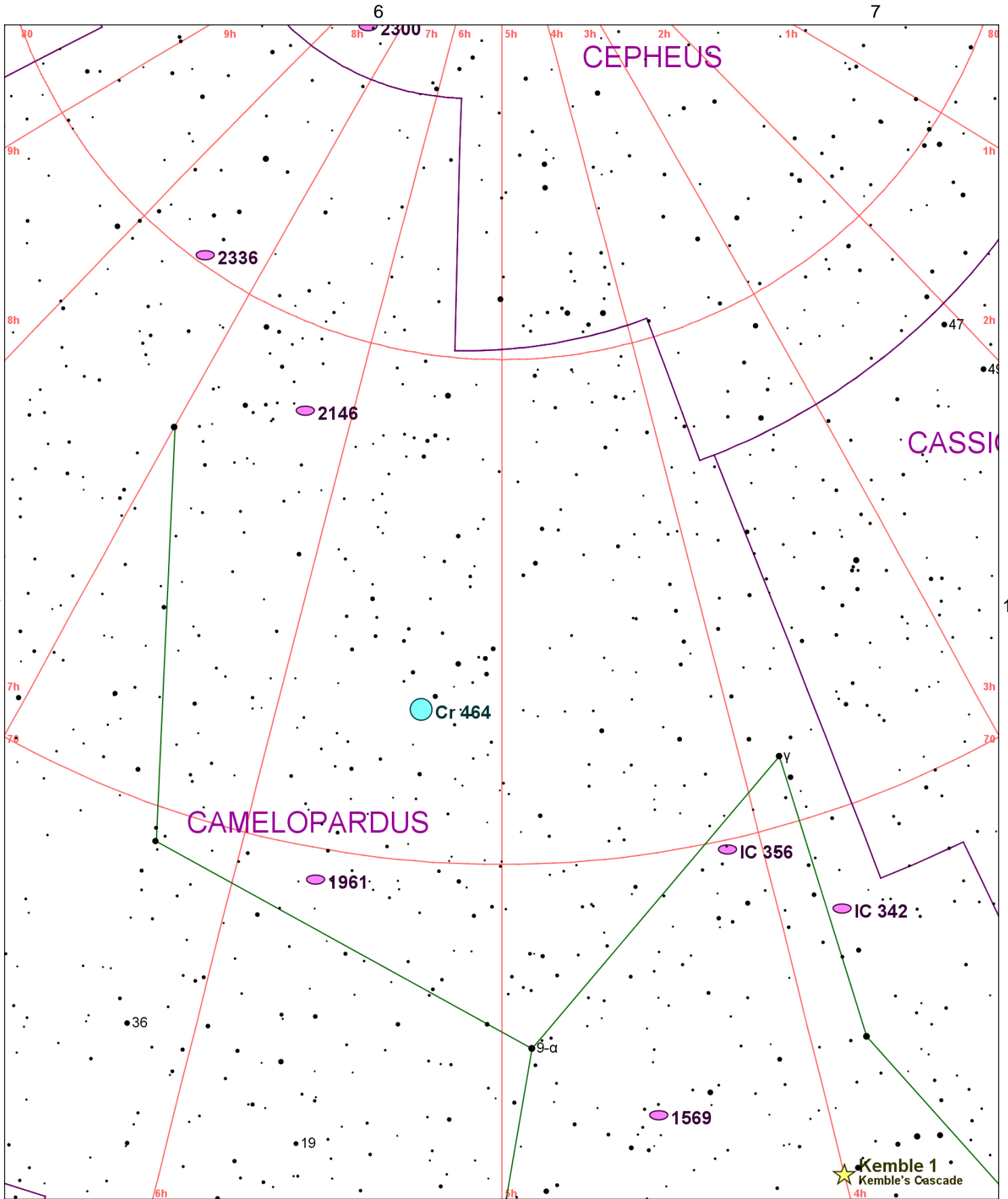


Chart 18													
Name	M	Const.	Mag.	Type	Size	R.A.	Decl.	C	R	S	O	# Stars	B
Common					Notes								
Cr 464		CAM	4.2	OC	120m	5h 22.0m	73° 00.0'					50	
IC 342		CAM	12.0	GAL	20.9m x 20.4m	3h 46.8m	68° 06.0'	C5					
F,vL,R,vsBN - Local Group Member													
IC 356		CAM	10.5	GAL	4.5m x 3.5m	4h 07.8m	69° 49.0'						
pF,pL,BM,* 8.5 4' north													
NGC 1569		CAM	11.0	GAL	3.7m x 1.8m	4h 30.8m	64° 51.0'				O		
pB,S,IE,BNM,*9.5n1' - H II 768;dk markings;well rrr;l trace of spiral structure													
NGC 1961		CAM	11.0	GAL	4.5m x 3.1m	5h 42.1m	69° 23.0'						
cF,pL,iF,mbM,er,* inv - H III 747;hexagonal;2 branch arms w some knots													
NGC 2146		CAM	10.6	GAL	5.7m x 3.3m	6h 18.6m	78° 21.0'				O		
pB,2'l,IE - extreme broad spiral arms;2 main smooth arms;1 w dark lane													
NGC 2300		CEP	11.0	GAL	3.5m x 2.4m	7h 32.3m	85° 43.0'						
pB,pL,IE,bM - Pair with NGC 2276 at 6' and IC 1455 at 10'; vsBN													
NGC 2336		CAM	10.4	GAL	6.8m x 3.7m	7h 27.1m	80° 11.0'						
pB,pL,R,2*11 nr - weak bar;many weak filam arms w knots; P w IC 467													
Kemble 1		CAM	5.0	AST		3h 60.0m	63° 00.0'					20	B
Kemble's Cascade					20 stars nearly in a row								

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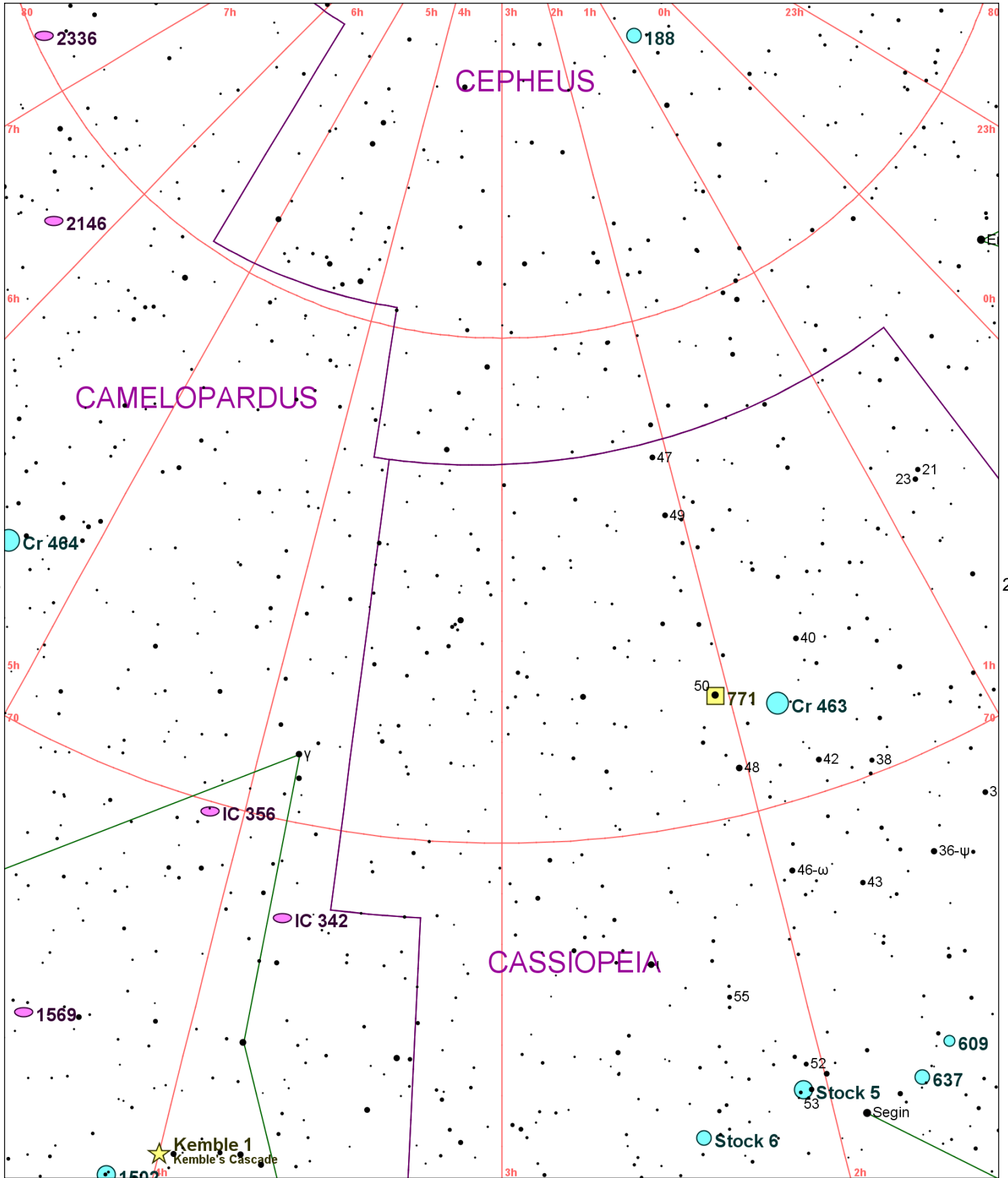


Chart 19													
Name	M	Const.	Mag.	Type	Size	R.A.	Decl.	C	R	S	O	# Stars	B
Common					Notes								
Cr 463		CAS	5.7	OC	36.0m	1h 48.4m	71° 57.0'					40	B
					13"-B,vL,nC, 44* at 60X								
Cr 464		CAM	4.2	OC	120m	5h 22.0m	73° 00.0'					50	
IC 342		CAM	12.0	GAL	20.9m x 20.4m	3h 46.8m	68° 06.0'	C5					
					F,vL,R,vsBN - Local Group Member								
IC 356		CAM	10.5	GAL	4.5m x 3.5m	4h 07.8m	69° 49.0'						
					pF,pL,BM,* 8.5 4' north								
NGC 188		CEP	8.1	OC	14.0m	0h 47.5m	85° 14.0'	C1			O	20	
					Cl,vL,R,150-200 st 10...18								
NGC 609		CAS	11.0	OC	3.0m	1h 36.4m	64° 32.0'						
					Cl,S,pRi,*14...								
NGC 637		CAS	8.2	OC	3.5m	1h 43.1m	64° 02.0'					20	
					Cl,pS,B & vF stars - H VII 49								
NGC 771		CAS	4.0	MISC		2h 03.4m	72° 25.0'						
					suspected neb *								
NGC 1502		CAM	6.9	OC	8m	4h 07.8m	62° 20.0'				O	45	
					Cl,pRi,cC,iF - H VII 47;Incl Struve 484 5"sep PA 130 & Struve 485 18" 6" 11"mul*								
NGC 1569		CAM	11.0	GAL	3.7m x 1.8m	4h 30.8m	64° 51.0'				O		
					pB,S,IE,BNM,*9.5n1' - H II 768;dk markings;well rrr;l trace of spiral structure								
NGC 2146		CAM	10.6	GAL	5.7m x 3.3m	6h 18.6m	78° 21.0'				O		
					pB,2'l,IE - extreme broad spiral arms;2 main smooth arms;1 w dark lane								
NGC 2336		CAM	10.4	GAL	6.8m x 3.7m	7h 27.1m	80° 11.0'						
					pB,pL,R,2*11 nr - weak bar;many weak filam arms w knots; P w IC 467								
Stock 5		CAS	7.0	OC	15.0m	2h 04.5m	64° 26.0'					25	
					13"-B,pL,nRi,nC at 100X; 17*; just naked eye								
Stock 6		CAS	10.0	OC	20.0m	2h 23.7m	63° 52.0'					20	
Kemble 1		CAM	5.0	AST		3h 60.0m	63° 00.0'					20	B
Kemble's Cascade					20 stars nearly in a row								

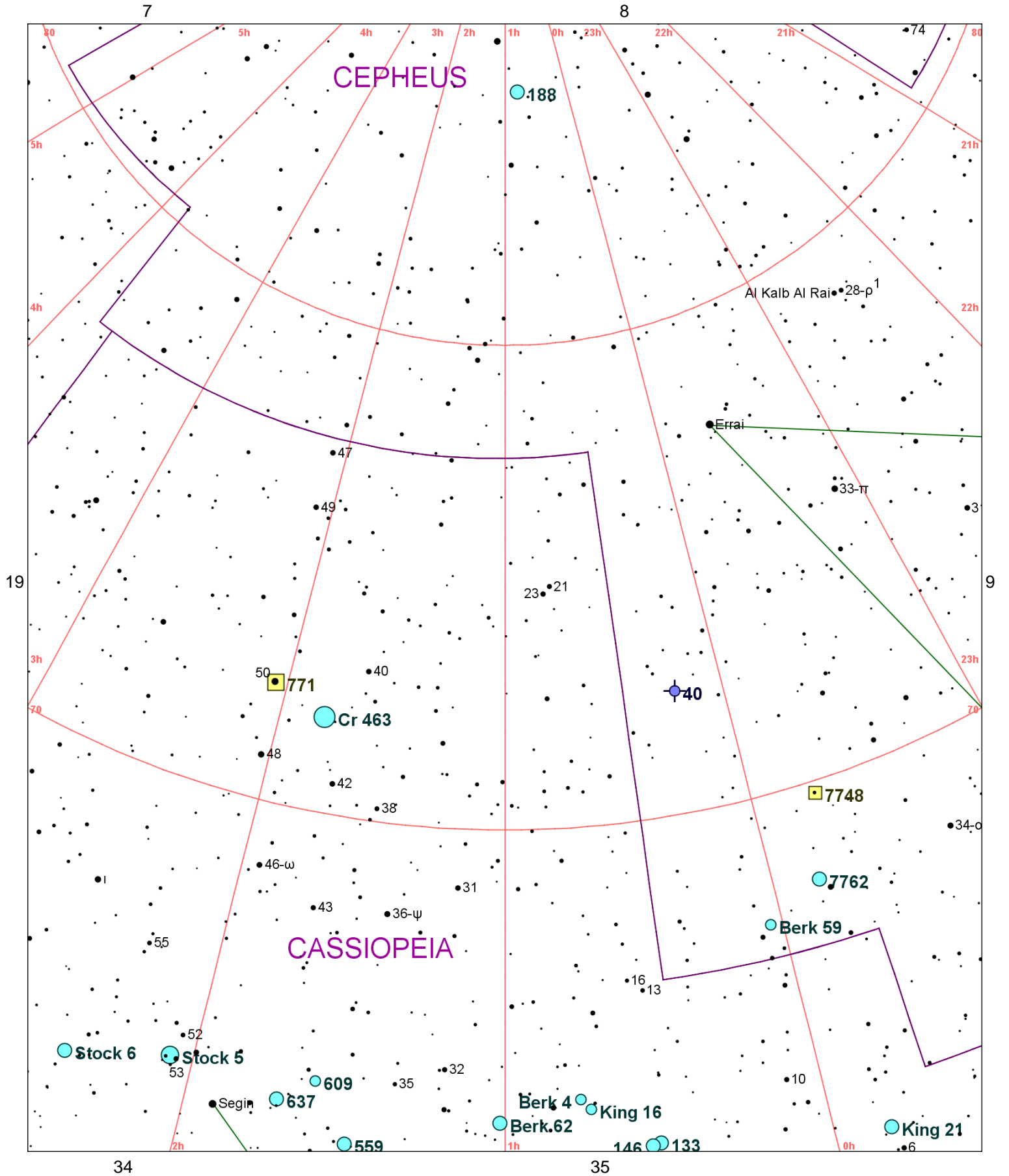


Chart 20													
Name	M	Const.	Mag.	Type	Size	R.A.	Decl.	C	R	S	O	# Stars	B
Common					Notes								
Berk 4		CAS	10.6	OC	5.0m	0h 45.5m	64° 24.0'					25	
Berk 59		CEP	11.0	OC	10.0m	0h 02.6m	67° 23.0'					40	
13"-F,S,nC, 12 F* at 135X													
Berk 62		CAS	9.3	OC	10.0m	1h 01.0m	63° 57.0'					50	
Cr 463		CAS	5.7	OC	36.0m	1h 48.4m	71° 57.0'					40	B
13"-B,vL,nC, 44* at 60X													
King 16		CAS	10.3	OC	3.0m	0h 43.7m	64° 11.0'					35	
compact and small													
King 21		CAS	9.8	OC	2.5m	23h 49.9m	62° 43.0'					20	
13"-pF,pS; 17* at 135X													
NGC 40		CEP	10.7	PN	60s x 40s	0h 13.0m	72° 31.0'	C2	R110	S19	O		
F,vS,R,vsmbM,L*cont f - H IV 58;PK120+9.1;Lord Rosse saw spiral structure													
NGC 133		CAS	9.4	OC	7.0m	0h 31.3m	63° 21.0'					5	
Cl,pL,st 10....D * inv													
NGC 146		CAS	9.1	OC	7.0m	0h 32.9m	63° 19.0'					20	
Cl,pL,IC,st 11-12,D*													
NGC 188		CEP	8.1	OC	14.0m	0h 47.5m	85° 14.0'	C1			O	20	
Cl,vL,R,150-200 st 10...18													
NGC 559		CAS	9.5	OC	4.4m	1h 29.5m	63° 19.0'	C8				60	
Cl,B,pL,pRi - H VII 48													
NGC 609		CAS	11.0	OC	3.0m	1h 36.4m	64° 32.0'						
Cl,S,pRi,*14...													
NGC 637		CAS	8.2	OC	3.5m	1h 43.1m	64° 02.0'					20	
Cl,pS,B & vF stars - H VII 49													
NGC 771		CAS	4.0	MISC		2h 03.4m	72° 25.0'						
suspected neb *													
NGC 7748		CEP	7.1	MISC		23h 44.9m	69° 45.0'						
vL neby,surrounds *7													
NGC 7762		CEP	10.0	OC	11.0m	23h 49.8m	68° 02.0'					40	
Cl,pRi,pC,*11...15 - H VII 55													
Stock 5		CAS	7.0	OC	15.0m	2h 04.5m	64° 26.0'					25	
13"-B,pL,nRi,nC at 100X; 17*; just naked eye													
Stock 6		CAS	10.0	OC	20.0m	2h 23.7m	63° 52.0'					20	

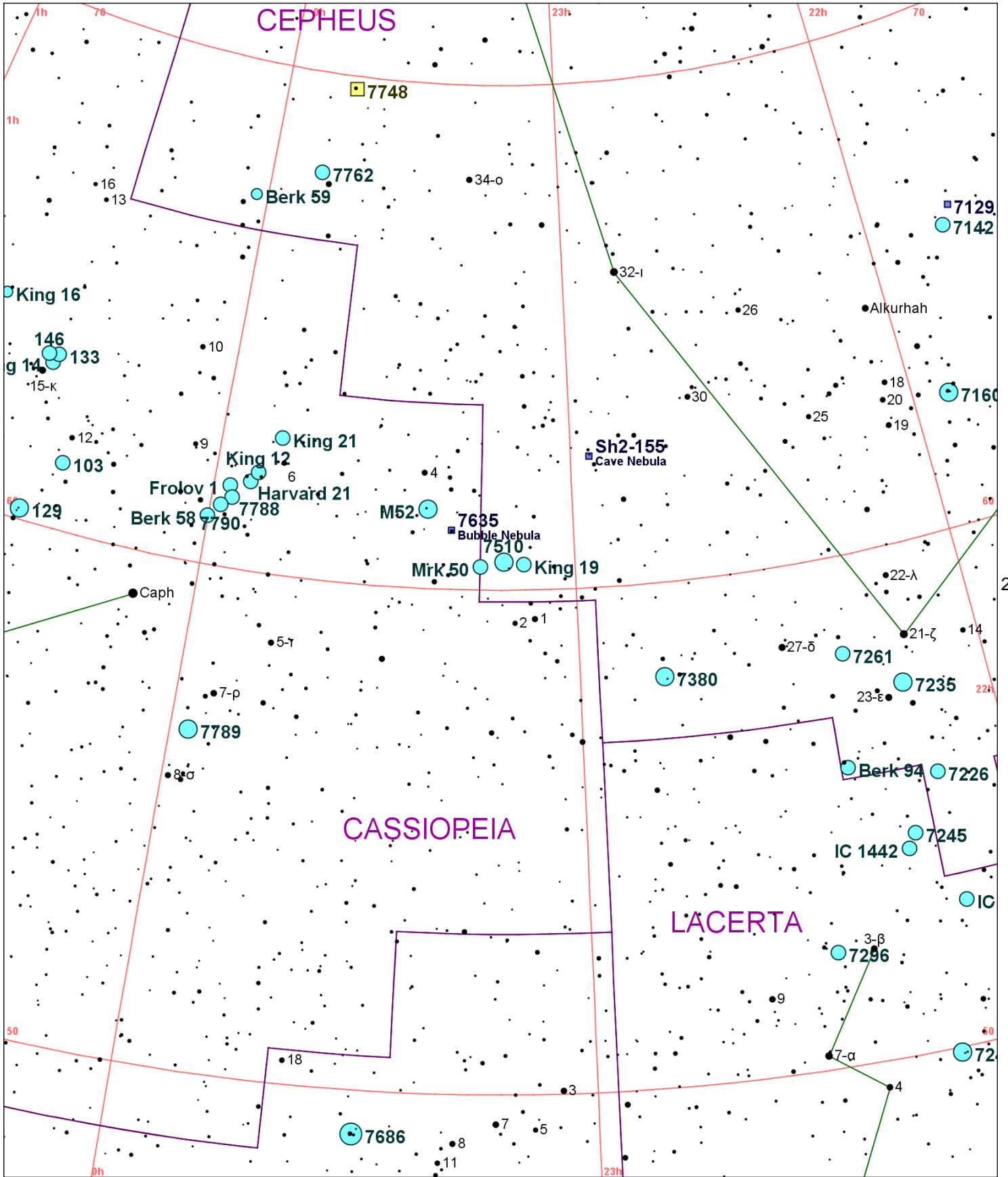


Chart 21													
Name	M	Const.	Mag.	Type	Size	R.A.	Decl.	C	R	S	O	# Stars	B
Common					Notes								
Berk 58		CAS	9.7	OC	8.0m	0h 00.2m	60° 58.0'					30	
Berk 59		CEP	11.0	OC	10.0m	0h 02.6m	67° 23.0'					40	
					13"-F,S,nC, 12 F* at 135X								
Berk 94		CEP	8.7	OC	4.0m	22h 22.7m	55° 51.0'					10	
Frolov 1		CAS	9.2	OC		23h 57.4m	61° 38.0'						
Harvard 21		CAS	9.0	OC	4.0m	23h 54.1m	61° 46.0'					6	
					pRi,C - 20 F*								
IC 1434		LAC	9.0	OC	8.0m	22h 10.5m	52° 50.0'					40	
					fine cl,6 branches,st 12-15 mag								
IC 1442		LAC	9.1	OC	5m	22h 16.5m	54° 03.0'					20	
					Cl of neb stars								
King 12		CAS	10.0	OC	2.0m	23h 53.0m	61° 58.0'					15	
					13"-pB,S,sE; 15* at 135X; D* invol - 27 stars from 10...16 mag								
King 14		CAS	8.5	OC	7.0m	0h 31.9m	63° 10.0'					20	
					13"-pB,pL,E; 20* nice dark lanes invl at 100X - Rich cl in rich field;29 * in 10' X 6'								
King 16		CAS	10.3	OC	3.0m	0h 43.7m	64° 11.0'					35	
					compact and small								
King 19		CEP	9.2	OC	7.0m	23h 08.3m	60° 31.0'					25	
					13"-pF,pS,nC; 12* at 165X								
King 21		CAS	9.8	OC	2.5m	23h 49.9m	62° 43.0'					20	
					13"-pF,pS; 17* at 135X								
Mrk 50		CEP	8.5	OC	5.0m	23h 15.3m	60° 28.0'					5	
					With binary HD 219460;very compressed 13 * in 3'								
NGC 103		CAS	9.8	OC	5.0m	0h 25.3m	61° 19.0'					30	
					Cl,pS,pC,st 11...18 - In Cas OB4								
NGC 129		CAS	6.5	OC	21.0m	0h 30.0m	60° 13.0'					35	B
					Cl,vL,pRi,IC,st 9...13 - H VIII 79;Contains DL Cas								
NGC 133		CAS	9.4	OC	7.0m	0h 31.3m	63° 21.0'					5	
					Cl,pL,st 10...D * inv								
NGC 146		CAS	9.1	OC	7.0m	0h 32.9m	63° 19.0'					20	
					Cl,pL,IC,st 11-12,D*								
NGC 7129		CEP	11.5	DN	2.7m	21h 43.0m	66° 07.0'		R109	S22	O	10	
					!,cF,pL,gbM*** - H IV 75;Sev F * invl								
NGC 7142		CEP	9.3	OC	4.3m	21h 45.2m	65° 46.0'					100	
					Cl,cL,cRi,pC,*11..14 - H VII 66								
NGC 7160		CEP	6.1	OC	7.0m	21h 53.7m	62° 36.0'					12	B
					Cl,P,vIC - H VIII 67;In Cep OB2								
NGC 7226		CEP	9.6	OC	1.8m	22h 10.5m	55° 25.0'					25	
					pB,L,in cluster								
NGC 7235		CEP	7.7	OC	4.0m	22h 12.6m	57° 17.0'					30	B
					Cl,pC,has a ruby *10								
NGC 7243		LAC	6.4	OC	21.0m	22h 15.1m	49° 54.0'	C16		S59	O	40	B
					Cl,L,P,IC,st vL - H VIII 75;Incl Struve 2890 D*								
NGC 7245		LAC	9.2	OC	5.0m	22h 15.3m	54° 20.0'						
					Cl,C,st eS - H VI 29;50 vF stars								
NGC 7261		CEP	8.4	OC	6.0m	22h 20.4m	58° 05.0'					30	
					Cl,L,pRi,IC								
NGC 7296		LAC	9.7	OC	4.0m	22h 28.2m	52° 17.0'					20	
					Cl,iR,IC,st vS - H VII 41								
NGC 7380		CEP	7.2	OC	12.0m	22h 47.3m	58° 08.0'					40	
					Cl,pL,pRi,IC,*9...13 - H VIII 77; In Cep OB1								
NGC 7510		CEP	7.9	OC	4.0m	23h 11.5m	60° 34.0'				O	60	
					Cl,pRi,pC,fan-sh,*pB - H VII 44;L region of F neby to SE								
NGC 7635		CAS	11.0	DN	15m x 8m	23h 20.2m	61° 11.0'	C11	R4		O		
Bubble Nebula					vF,*8 inv l excentric - H IV 52;L neb ring								
NGC 7654	M52	CAS	6.9	OC	13.0m	23h 24.2m	61° 35.0'				O	200	B
					L,Ri,mCM,*9..13 - Messier saw neby there is none								

Chart 21													
Name	M	Const.	Mag.	Type	Size	R.A.	Decl.	C	R	S	O	# Stars	B
Common					Notes								
NGC 7686		AND	5.6	OC	15.0m	23h 30.1m	49° 08.0'					20	
					Cl,P,IC,st 7...11 - H VIII 69;12* mags 8...13								
NGC 7748		CEP	7.1	MISC		23h 44.9m	69° 45.0'						
					vL neby,surrounds *7								
NGC 7762		CEP	10.0	OC	11.0m	23h 49.8m	68° 02.0'					40	
					Cl,pRi,pC,*11...15 - H VII 55								
NGC 7788		CAS	9.4	OC	9.0m	23h 56.7m	61° 24.0'					20	
					Cl,S,pRi,vC,st 10,13.. - in Cas OB5?								
NGC 7789		CAS	6.7	OC	16m	23h 57.4m	56° 43.0'		R5	S16	O	300	B
					Cl,vL,vRi,vmC,st 11...18 - H VI 30;1000 members from 11 to 18 mag								
NGC 7790		CAS	8.5	OC	17m	23h 58.4m	61° 13.0'					40	
					Cl,pRi,pC - H VII 56;Contains CE Cas								
Sh2-155		CEP		DN	50m x 30m	22h 56.8m	62° 37.0'	C9					
Cave Nebula													

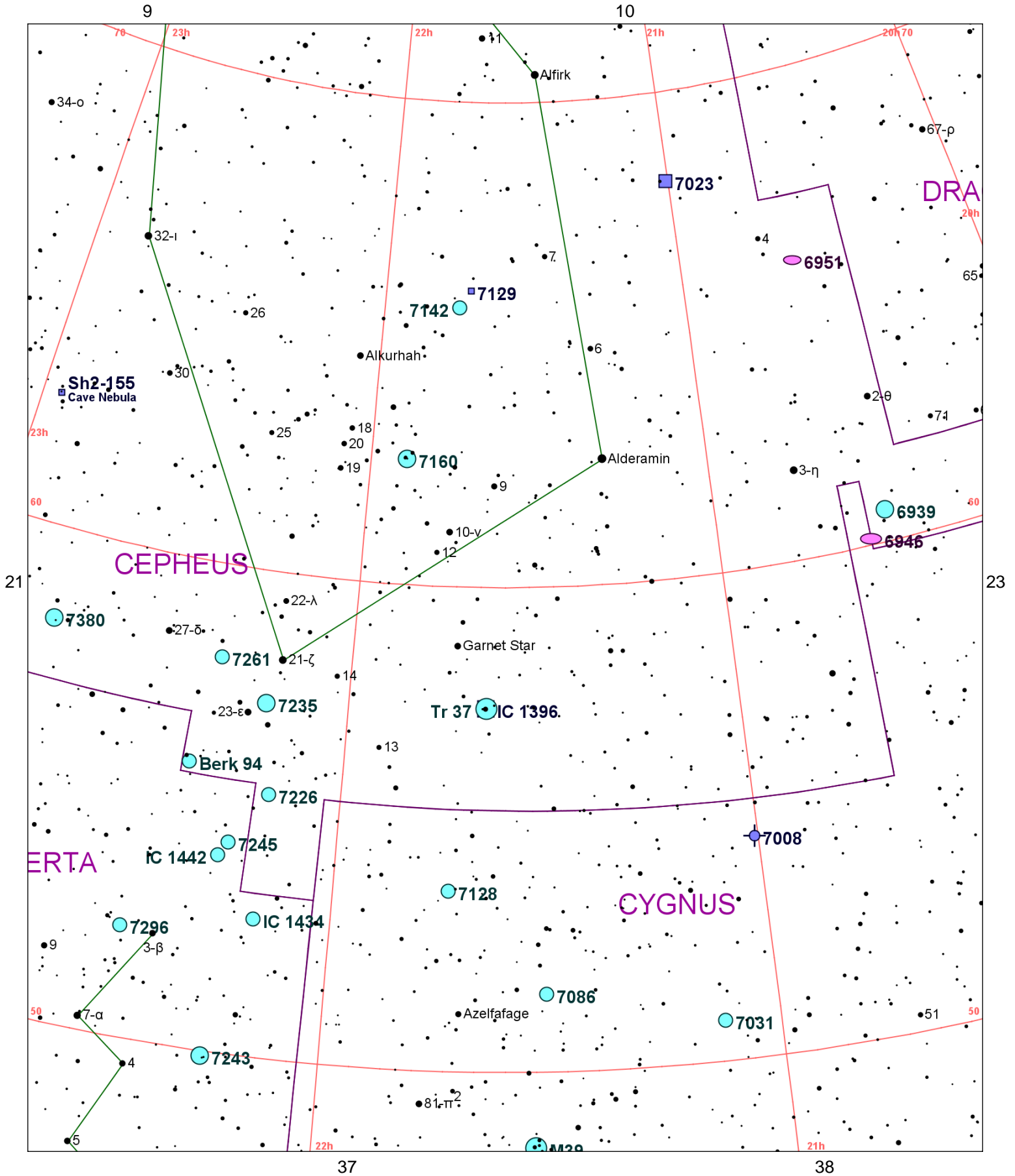


Chart 22													
Name	M	Const.	Mag.	Type	Size	R.A.	Decl.	C	R	S	O	# Stars	B
Common					Notes								
Berk 94		CEP	8.7	OC	4.0m	22h 22.7m	55° 51.0'					10	
IC 1396		CEP	3.5	DN	89m	21h 39.1m	57° 30.0'				O	50	
					F,eL,neby,incl Struve 2816 - In Cep OB2;Neby is 165'X135';cluster is Tr 37								
IC 1434		LAC	9.0	OC	8.0m	22h 10.5m	52° 50.0'					40	
					fine cl,6 branches,st 12-15 mag								
IC 1442		LAC	9.1	OC	5m	22h 16.5m	54° 03.0'					20	
					Cl of neb stars								
NGC 6939		CEP	7.8	OC	8.0m	20h 31.5m	60° 40.0'		R107	S20	O	80	
					Cl,pL,eRi,pCM,*11..16 - H VI 42;Gal N6946 38' SE								
NGC 6946		CEP	8.8	GAL	11.2m x 9.8m	20h 34.9m	60° 09.0'	C12	R108	S21	O		
					vF,vL,vg,vsbM,rr - H IV 76;One of nearest spirals								
NGC 6951		CEP	10.6	GAL	3.9m x 3.5m	20h 37.2m	66° 06.0'						
					pB,pL,IE								
NGC 7008		CYG	12.0	PN	86s x 69s	21h 00.5m	54° 33.0'				O		
					cB,L,E45,r,** att - H I 192								
NGC 7023		CEP	7.1	DN	5.0m	21h 00.5m	68° 10.0'	C4			O		
					*7 in eF,eL,neby - H IV 74;Complex structure w Br and dark filaments								
NGC 7031		CYG	9.1	OC	5.0m	21h 07.3m	50° 50.0'					50	
					Cl of triple st,IC - H VIII 74								
NGC 7086		CYG	8.4	OC	9.0m	21h 30.5m	51° 36.0'					50	
					Cl,cL,vRi,pC,*11..16 - H VI 32								
NGC 7092	M39	CYG	4.6	OC	32m	21h 32.2m	48° 26.0'				O	30	B
					Cl,vL,P,vIC,*7...10 - Large but loose cluster								
NGC 7128		CYG	9.7	OC	3.1m	21h 44.0m	53° 43.0'					35	
					Cl,S,pRi,has a ruby *9.5 - H VII 40								
NGC 7129		CEP	11.5	DN	2.7m	21h 43.0m	66° 07.0'		R109	S22	O	10	
					!,cF,pL,gbM*** - H IV 75;Sev F * invl								
NGC 7142		CEP	9.3	OC	4.3m	21h 45.2m	65° 46.0'					100	
					Cl,cL,cRi,pC,*11..14 - H VII 66								
NGC 7160		CEP	6.1	OC	7.0m	21h 53.7m	62° 36.0'					12	B
					Cl,P,vIC - H VIII 67;In Cep OB2								
NGC 7226		CEP	9.6	OC	1.8m	22h 10.5m	55° 25.0'					25	
					pB,L,in cluster								
NGC 7235		CEP	7.7	OC	4.0m	22h 12.6m	57° 17.0'					30	B
					Cl,pC,has a ruby *10								
NGC 7243		LAC	6.4	OC	21.0m	22h 15.1m	49° 54.0'	C16		S59	O	40	B
					Cl,L,P,IC,st vL - H VIII 75;Incl Struve 2890 D*								
NGC 7245		LAC	9.2	OC	5.0m	22h 15.3m	54° 20.0'						
					Cl,C,st eS - H VI 29;50 vF stars								
NGC 7261		CEP	8.4	OC	6.0m	22h 20.4m	58° 05.0'					30	
					Cl,L,pRi,IC								
NGC 7296		LAC	9.7	OC	4.0m	22h 28.2m	52° 17.0'					20	
					Cl,iR,IC,st vS - H VII 41								
NGC 7380		CEP	7.2	OC	12.0m	22h 47.3m	58° 08.0'					40	
					Cl,pL,pRi,IC,*9...13 - H VIII 77; In Cep OB1								
Sh2-155		CEP		DN	50m x 30m	22h 56.8m	62° 37.0'	C9					
Cave Nebula													
Tr 37		CEP	5.1	OC	50.0m	21h 39.0m	57° 30.0'					30	
					In IC 1396 nebula								

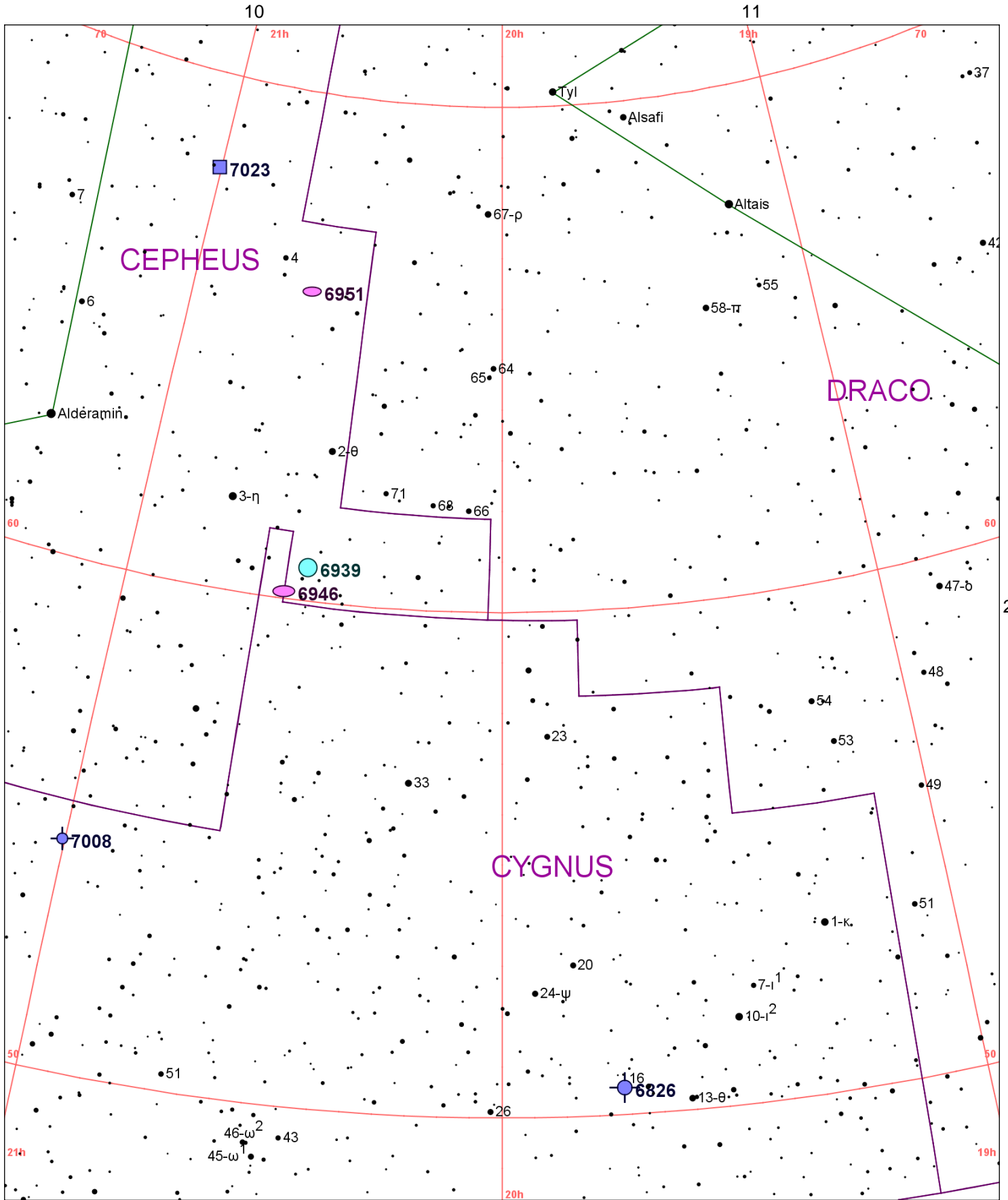


Chart 23													
Name	M	Const.	Mag.	Type	Size	R.A.	Decl.	C	R	S	O	# Stars	B
Common					Notes								
NGC 6826		CYG	8.8	PN	27s x 24s	19h 44.8m	50° 32.0'	C15	R97	S43	O		
					Planetary,B,pL,R,*11m - H IV 73;Blinking Planetary;PK83+12.1								
NGC 6939		CEP	7.8	OC	8.0m	20h 31.5m	60° 40.0'		R107	S20	O	80	
					Cl,pL,eRi,pCM,*11..16 - H VI 42;Gal N6946 38' SE								
NGC 6946		CEP	8.8	GAL	11.2m x 9.8m	20h 34.9m	60° 09.0'	C12	R108	S21	O		
					vF,vL,vg,vsbM,rr - H IV 76;One of nearest spirals								
NGC 6951		CEP	10.6	GAL	3.9m x 3.5m	20h 37.2m	66° 06.0'						
					pB,pL,IE								
NGC 7008		CYG	12.0	PN	86s x 69s	21h 00.5m	54° 33.0'				O		
					cB,L,E45,r,** att - H I 192								
NGC 7023		CEP	7.1	DN	5.0m	21h 00.5m	68° 10.0'	C4			O		
					*7 in eF,eL,neby - H IV 74;Complex structure w Br and dark filaments								

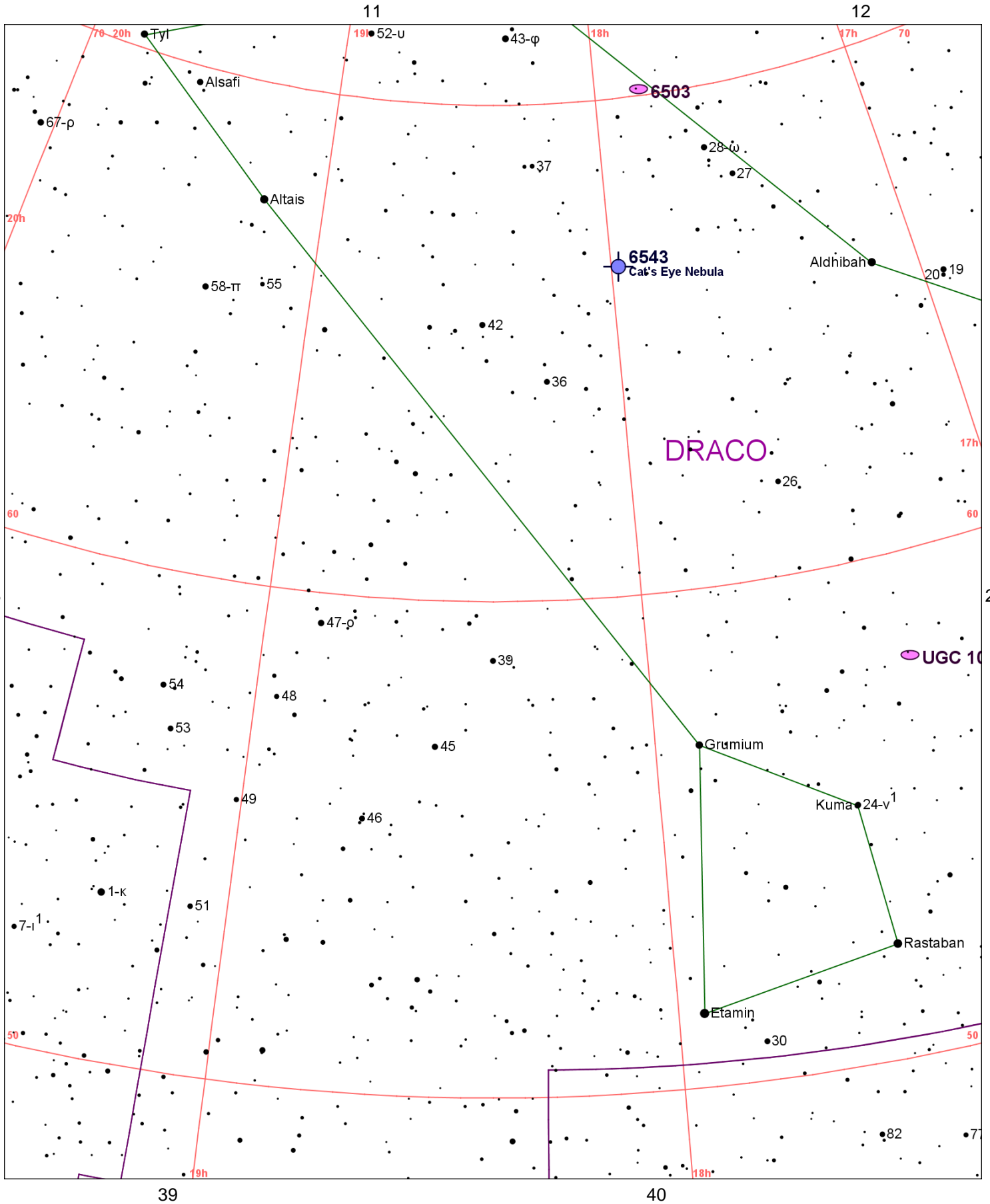


Chart 24													
Name	M	Const.	Mag.	Type	Size	R.A.	Decl.	C	R	S	O	# Stars	B
Common					Notes								
NGC 6503		DRA	10.2	GAL	7m x 2.5m	17h 49.5m	70° 09.0'		R88	S49	O		
					pF,L,mE,*9f4'								
NGC 6543		DRA	8.3	PN	22s x 16s	17h 58.6m	66° 38.0'	C6	R89	S50	O		
Cat's Eye Nebula					vB,pS,sbMvSN - H IV 37;PK96+29.1								
UGC 10822		DRA	9.9	GAL	33.5m x 18.9m	17h 20.2m	57° 55.0'						
					13"-vF,L,pmE at 60X - Member of Local Group;dwarf elliptical								