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*   V A R I A B I L I A
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*   nummer 30      februari 1991
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*   Redactie:
*                   H. Feijth
*                   Oer de Feart 7
*                   9084 BP Goutum
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WAARNEMINGSRESULTATEN
OKTOBER-DECEMBER 1990

In totaal werden 1002 schattingen verricht in het laatste kwartaal van 1990. Zoals gebruikelijk werden in december de minste waarnemingen verkregen. In de nu volgende tabel zijn per waarnemer en per maand de observaties uitgesplitst.

Als nieuwe waarnemer mogen wij de heer F. de Vries uit Lelystad begroeten.

waarnemer		OKT		NOV		DEC	
R.J. Bouma	BMU					6	
G. Comello	CMG	4	(2)				
H. Feijth	FJH	450	(116)	368	(50)	77	(21)
H. v.d. Hil	HIL	3		5		5	
G. Hoogeveen	HOO	2				13	
P.C.A. Kerkvliet	KKP	6		9		9	
A. Scholten	SAQ	17		19		10	
F. de Vries	VRI	5					
totaal		487		401		120	

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WAARNEMINGSRESULTATEN 1990

Na het topjaar 1989 zijn de aantallen beduidend minder (6785) in 1990 zonder

dat sprake is van geringe activiteit van de waarnemers. We hebben wel eens jaren gehad dat het jaartotaal nog niet eens de helft was ! Verder is nog op te merken dat er geen nova was die altijd aanleiding geeft tot verhoogde waarnemingsactiviteit. Hopenlijk worden wij binnenkort verrast door de verschijning van een heldere nova !

In de nu volgende tabel volgt per waarnemer het totaal aantal uitgevoerde schattingen. De "inner sanctums" betreffen het aantal positieve schattingen van 13.8 en zwakker en de negatieve zwakker dan 14.0.

Ook is vermeld het gebruikte instrumentarium. De afkorting N houdt in dat met een Newton teleskoop is waargenomen, R met een refractor, B met een prismakijker, SC met een Schmidt-Cassegrain (Celestron) en JB met een Jones-Bird teleskoop. Het onmiddellijk daarop volgende getal geeft aan hoe groot de opening in millimeters is.

waarnemer	afk	aantal	inner sanctums	instrumenten
R.J. Bouma	BMU	230	6	JB254 en N156
H.J. Brill	BHN	41		SC200
V. van den Bosch	BOS	5		N150
G. Comello	CMG	1888	281	SC280 en SC200
M. van Denneheuvel	DEN	28		SC200
H. Feijth	FJH	3759	971	N310, JB315, N110
H. v.d. Hil	HIL	19		N110
G. Hoogeveen	HOO	228	1	N112
C.F. Johannink	JCH	60		N110
P.C.A. Kerkvliet	KKP	85		R75
G. Kuipers	KPG	100	9	N254
W. Nobel	NWL	26		R75
A. Scholten	SAQ	102		B15x80
P. Serné	SEN	136		R60, R100 en R160
A.J.M. Toonen	TOO	73	1	SC200
F. de Vries	VRI	5		N200

Om een idee te krijgen wat de helderheid is van de veranderlijken die geschat zijn volgt in de volgende tabel per waarnemer de verdeling over de grootteklassen. Hieruit kan men afleiden wie naar verhouding heldere of zwakke schattingen levert.

Waarn	<=6	7	8	9	10	11	12	13	14	15	totaal
BMU	18	9	20	24	33	32	50	33	9	1	230
BHN	1	1	6	10	5	8	6	3	1	0	41
BOS	0	0	2	1	0	1	1	0	0	0	5
CMG	20	20	76	191	269	310	345	319	247	87	1888
DEN	0	1	4	16	5	0	2	0	0	0	28
FJH	2	13	62	169	312	499	746	848	713	357	3759
HIL	5	2	3	4	5	0	0	0	0	0	19
HOO	7	5	22	29	53	39	42	20	1	0	228
JCH	7	2	7	15	21	7	1	0	0	0	60
KKP	2	14	14	28	15	11	1	0	0	0	85
KPG	1	2	4	9	20	22	21	10	11	0	100
NWL	0	3	9	8	2	1	3	0	0	0	26
SAQ	17	14	30	29	11	1	0	0	0	0	102
SEN	4	6	30	34	18	32	12	0	0	0	136
TOO	1	4	4	19	4	11	13	12	5	0	73
VRI	0	0	0	1	1	0	3	0	0	0	5

OBSERVARIA Na drie achtereenvolgende zachte winters is het wel wennen om in de vrieskou waarnemingen te doen. Gelukkig was het wel de moeite waard. Niet alleen SS Cygni (eind januari) en SS Aurigae (begin februari) hadden een maximum, maar YZ Cancri beleefde begin februari een supermaximum! Het prototype SU Ursae Maioris blonk daar-entegen uit in saaiheid; sinds de jaarwisseling is niet één maximum waargenomen. YZ Cnc deed wat SU Uma naliet; twee maxima in één week! Z Camelopardalis gedraagt zich nu als een "gewone" U Geminorum ster, maar RX Andromedae verkeert nog steeds in de stilstandfase. R Coronae Borealis is nog steeds in het maximum, wat niet betekent dat de waarnemers met prismakijkers deze ster moeten verwaarlozen. Bij de Mira sterren die op ons programma staan is van opvallend afwijkend gedrag nauwelijks sprake. RW Andromedae beleefde een helder maximum (8.4). Het helderst waargenomen maximum van RW And is 7.9 en het zwakst

000451 SS Cas type Mira HIP	172.5 129 FJH 183.4 125 FJH 201.4 116 FJH 215.4 114 FJH	type Mira HIP 003162 TY Cas type Mira	005840 RX And type UGZ	187.5 123 FJH 201.5 126 FJH 214.4 128 FJH 232.3 134 FJH	187.5 123 FJH 201.5 126 FJH 214.4 128 FJH 232.3 134 FJH	013937 AR And type UGSS
172.3 134 FJH 178.4 131 FJH 187.3 126 FJH 201.3 105 FJH	201.4 116 FJH 215.4 114 FJH	003179 Y Cep type Mira	172.41 115 FJH 176.40 116 FJH 178.36 116 FJH 181.49 116 FJH 183.36 116 FJH 187.34 116 FJH 188.47 115 FJH 189.53 115 FJH 199.43 115 FJH 201.51 116 FJH 204.44 116 FJH 211.32 116 FJH 215.43 116 FJH 223.37 116 FJH 229.46 116 FJH 232.33 116 FJH	011272 S Cas type Mira	169.4 107 FJH 181.5 106 FJH 189.4 112 FJH 200.4 112 FJH 217.4 113 FJH 229.5 116 FJH	177.30 125 FJH 178.36 124 FJH 229.46 116 FJH 232.33 123 FJH 233.26 125 FJH
000928 UW And type Mira	186.5 :145 FJH	004047 U Cas type Mira	010621A X Psc type Mira	178.5 142 FJH 186.5 145 FJH 214.4 140 FJH 232.4 122 FJH	189.4 112 FJH 200.4 112 FJH 217.4 113 FJH 229.5 116 FJH	015457 V666Cas type Mira
186.3 137 FJH 200.4 128 FJH 215.4 119 FJH 232.3 117 FJH	003179 Y Cep type Mira	183.3 90 FJH 186.4 86 VRI 201.5 93 FJH	186.4 147 FJH 214.4 141 FJH 232.3 139 FJH	012020 RX Psc type Mira	181.5 117 FJH 188.5 119 FJH 201.5 125 FJH 217.5 134 FJH 232.3 140 FJH	189.4 127 FJH
001046 X And type Mira	178.4 116 FJH 187.3 120 FJH 200.4 127 FJH 217.4 135 FJH	004132 RW And type Mira	010937 FO And type UG	172.5 122 FJH 181.4 127 FJH 188.3 127 FJH 214.4 141 FJH 232.3 147 FJH	015912 S Ari type Mira	015912 S Ari type Mira
172.5 135 FJH 181.5 126 FJH 199.4 115 FJH 217.4 101 FJH	004047 U Cas type Mira	178.5 129 FJH 187.4 109 FJH 199.4 86 FJH 216.2 82 FJH 224.3 83 FJH	186.4 147 FJH 214.4 141 FJH 232.3 139 FJH	012502 R Psc type Mira	181.5 117 FJH 188.5 119 FJH 201.5 125 FJH 217.5 134 FJH 232.3 140 FJH	015912 S Ari type Mira
001726 T And type Mira	004132 RW And type Mira	004435 V And type Mira	010940 U And type Mira	172.5 122 FJH 181.4 127 FJH 188.3 127 FJH 214.4 141 FJH 232.3 147 FJH	181.5 117 FJH 188.5 119 FJH 201.5 125 FJH 217.5 134 FJH 232.3 140 FJH	020114 TT Ari type UGZ
172.4 140 FJH 178.4 141 FJH 186.4 141 FJH 201.4 143 FJH 214.4 142 FJH 232.3 134 FJH	004132 RW And type Mira	172.5 96 FJH 181.5 96 FJH 199.4 92 FJH 216.2 97 FJH 224.3 99 FJH	214.39 141 FJH 217.43 144 FJH 233.26 151 FJH	012502 R Psc type Mira	181.5 117 FJH 188.5 119 FJH 201.5 125 FJH 217.5 134 FJH 232.3 140 FJH	020114 TT Ari type UGZ
001755 T Cas type Mira HIP	004435 V And type Mira	004533 RR And type Mira	010940 U And type Mira	172.5 122 FJH 181.4 127 FJH 188.3 127 FJH 214.4 141 FJH 232.3 147 FJH	176.4 137 FJH 186.5 135 FJH 201.4 119 FJH 214.4 104 FJH 229.5 100 FJH	020227 Z Tri type Mira
183.3 96 FJH 189.4 100 FJH 201.3 101 FJH 217.4 109 FJH 229.5 108 FJH 249.5 106 HOO	004435 V And type Mira	176.4 146 FJH 186.3 149 FJH 204.4 146 FJH 214.4 140 FJH 232.3 134 FJH	172.5 103 FJH 183.5 104 FJH 199.4 112 FJH 211.3 118 FJH 229.5 122 FJH	012746 SX And type Mira	176.4 137 FJH 186.5 135 FJH 201.4 119 FJH 214.4 104 FJH 229.5 100 FJH	020657A TZ Per type UGZ
001838 R And type Mira HIP	172.5 96 FJH 181.5 96 FJH 199.4 92 FJH 216.2 97 FJH 224.3 99 FJH	011041A UZ And type Mira	011041A UZ And type Mira	178.4 101 FJH 188.3 100 FJH 201.5 106 FJH	176.4 137 FJH 186.5 135 FJH 201.4 119 FJH 214.4 104 FJH 229.5 100 FJH	020657A TZ Per type UGZ
172.4 112 FJH 178.4 108 SAQ 181.4 115 FJH 187.4 117 VRI 188.3 118 FJH 199.4 118 FJH 214.3 121 FJH 232.3 131 FJH	004533 RR And type Mira	011055A VZ Cas type Mira	011055A VZ Cas type Mira	176.4 125 FJH 187.3 121 FJH 201.3 112 FJH 229.5 99 FJH	176.4 137 FJH 186.5 135 FJH 201.4 119 FJH 214.4 104 FJH 229.5 100 FJH	020657A TZ Per type UGZ
0019-09 S Cet type Mira	186.3 147 FJH 204.4 146 FJH 214.4 140 FJH 232.3 134 FJH	004746A RV Cas type Mira	011055A VZ Cas type Mira	176.4 125 FJH 187.3 121 FJH 201.3 112 FJH 229.5 99 FJH	176.4 137 FJH 186.5 135 FJH 201.4 119 FJH 214.4 104 FJH 229.5 100 FJH	020657A TZ Per type UGZ
181.4 137 CMG 186.4 138 FJH	004746A RV Cas type Mira	176.4 125 FJH 187.3 121 FJH 201.3 112 FJH 229.5 99 FJH	013050 KT Per type UGZ	176.4 125 FJH 187.3 121 FJH 201.3 112 FJH 229.5 99 FJH	176.4 137 FJH 186.5 135 FJH 201.4 119 FJH 214.4 104 FJH 229.5 100 FJH	020657A TZ Per type UGZ
002725A TU And	188.3 :160 FJH	004958 W Cas type Mira HIP	011208 S Psc type Mira	169.5 91 FJH 181.5 97 FJH 201.5 108 FJH 215.4 122 FJH 223.3 126 FJH 233.3 136 FJH	173.34 144 FJH 176.41 137 FJH 177.30 129 FJH 178.44 127 FJH 183.49 126 FJH 186.47 137 FJH 187.44 140 FJH 188.39 141 FJH 201.31 129 FJH 204.31 134 FJH 211.33 128 FJH 214.54 136 FJH 229.48 126 FJH 233.25 128 FJH 234.52 135 FJH	020657A TZ Per type UGZ
	004958 W Cas type Mira HIP	172.5 121 FJH 181.4 124 FJH	011208 S Psc type Mira	169.5 91 FJH 181.5 97 FJH 201.5 108 FJH 215.4 122 FJH 223.3 126 FJH 233.3 136 FJH	173.34 144 FJH 176.41 137 FJH 177.30 129 FJH 178.44 127 FJH 183.49 126 FJH 186.47 137 FJH 187.44 140 FJH 188.39 141 FJH 201.31 129 FJH 204.31 134 FJH 211.33 128 FJH 214.54 136 FJH 229.48 126 FJH 233.25 128 FJH 234.52 135 FJH	020657A TZ Per type UGZ
	186.4 99 VRI 189.4 106 FJH	172.5 121 FJH 181.4 124 FJH	011208 S Psc type Mira	169.5 91 FJH 181.5 97 FJH 201.5 108 FJH 215.4 122 FJH 223.3 126 FJH 233.3 136 FJH	173.34 144 FJH 176.41 137 FJH 177.30 129 FJH 178.44 127 FJH 183.49 126 FJH 186.47 137 FJH 187.44 140 FJH 188.39 141 FJH 201.31 129 FJH 204.31 134 FJH 211.33 128 FJH 214.54 136 FJH 229.48 126 FJH 233.25 128 FJH 234.52 135 FJH	020657A TZ Per type UGZ
		172.5 121 FJH 181.4 124 FJH	011208 S Psc type Mira	169.5 91 FJH 181.5 97 FJH 201.5 108 FJH 215.4 122 FJH 223.3 126 FJH 233.3 136 FJH	173.34 144 FJH 176.41 137 FJH 177.30 129 FJH 178.44 127 FJH 183.49 126 FJH 186.47 137 FJH 187.44 140 FJH 188.39 141 FJH 201.31 129 FJH 204.31 134 FJH 211.33 128 FJH 214.54 136 FJH 229.48 126 FJH 233.25 128 FJH 234.52 135 FJH	020657A TZ Per type UGZ

187.4	116	VRI	200.4	112	FJH	176.4	139	FJH	043274	X	Cam	176.5	118	FJH
201.4	103	FJH	217.4	106	FJH	186.4	143	FJH	type	Mira	HIP	186.4	121	FJH
216.2	95	FJH	229.5	97	FJH	204.3	142	FJH				199.5	122	FJH
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021143A	W	And	023133	R	Tri	214.4	140	FJH	172.5	114	FJH	214.6	128	FJH
type	Mira	HIP	type	Mira	HIP	232.4	131	FJH	178.4	119	FJH	225.5	128	FJH
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169.5	122	FJH	178.4	63	SAQ	032443	GK	Per	187.4	126	FJH	234.5	129	FJH
178.4	123	FJH	186.4	62	HIL	type	Na		204.4	127	FJH	054319 SU Tau		
189.4	121	FJH	188.3	70	SAQ				214.4	125	FJH	type RCB		
201.4	122	FJH	188.3	76	FJH	178.49	129	FJH	223.3	115	FJH	<hr/>		
211.3	117	FJH	205.4	82	FJH	186.48	130	FJH	044617 V Tau			188.4	95	FJH
224.3	91	FJH	213.4	78	HIL	204.44	129	FJH	type Mira			225.5	95	FJH
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0214-03	Mira		218.3	83	SAQ	223.36	129	FJH	176.4	123	FJH	054615A Z Tau		
type	Mira	HIP	226.4	78	KKP	232.37	129	FJH	188.4	115	FJH	type Mira		
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173.7	35	SAQ	226.4	88	SAQ	034532	RX	Per	205.5	115	FJH	186.5 133 FJH		
178.4	37	SAQ	233.4	89	HIL	type	Mira		044907 FG Ori			205.5 133 FJH		
181.4	42	CMG	233.4	90	SAQ				type Mira			<hr/>		
186.5	38	SAQ	242.4	92	HIL	176.5	148	FJH	189.6 124 FJH			054615C RU Tau		
192.5	42	BMU	030226 Z Ari			186.4	148	FJH	205.5 129 FJH			type Mira		
201.4	37	SAQ	type	Mira		034711	IK	Tau	050953 R Aur			186.5 138 FJH		
214.4	45	HIL				type	Mira		type Mira HIP			205.5 135 FJH		
215.3	43	BMU	176.5	129	FJH	188.5	148	FJH	<hr/>			<hr/>		
218.3	45	SAQ	186.5	132	FJH	040150 FO Per			183.5 84 FJH			054920A U Ori		
231.3	50	SAQ	205.4	137	FJH	type UG			200.4 86 FJH			type Mira HIP		
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021558	S	Per	214.4	140	FJH	176.44	130	FJH	052036 W Aur			184.5 74 FJH		
type	SRc	HIP	232.3	143	FJH	178.44	128	FJH	type Mira			199.5 73 FJH		
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189.3	102	FJH	030514 U Ari			186.47	135	FJH	176.4 129 FJH			204.6 73 KKP		
205.4	104	FJH	type	Mira		187.44	136	FJH	186.4 134 FJH			205.5 73 FJH		
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021770	AM	Cas	181.5	116	FJH	188.46	143	FJH	204.4 138 FJH			218.6 71 KKP		
type	UGSS		188.5	119	FJH	214.54	129	FJH	214.6 141 FJH			226.5 69 KKP		
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172.33	126	FJH	201.5	123	FJH	041916 VX Tau			232.4 144 FJH			233.4 73 KKP		
173.35	128	FJH	217.5	127	FJH	type Mira			052607 BK Ori			242.5 71 KKP		
176.41	144	FJH	229.5	129	FJH				type Mira			256.4 69 KKP		
183.35	132	FJH	031170 V667Cas			186.5	:147	FJH	052607 BK Ori			054974 V Cam		
186.47	143	FJH	type	Mira					189.6 122 FJH			type Mira		
187.32	142	FJH	204.4	103	FJH	042209 R Tau			205.5 128 FJH			172.5 109 FJH		
188.46	144	FJH	214.5	103	HIL	type Mira			053337 RU Aur			181.5 111 FJH		
189.54	143	FJH	218.3	103	SAQ	<hr/>			type Mira HIP			187.5 114 FJH		
204.36	134	FJH	225.6	101	HIL	188.4	91	FJH	<hr/>			198.4 113 FJH		
205.39	138	FJH	233.4	98	HIL	042309 S Tau			186.4 :151 FJH			214.4 117 FJH		
214.56	134	FJH	233.4	101	SAQ	type Mira			205.5 :148 FJH			223.3 119 FJH		
217.43	128	FJH	242.4	96	HIL	<hr/>			217.5 145 FJH			<hr/>		
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022150	RR	Per	032043 Y Per			186.5	:152	FJH	225.5 129 FJH			055439 AZ Aur		
type	Mira		type	Mira		215.4	149	FJH	234.5 119 FJH			type Mira		
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176.5	126	FJH	178.4	95	SAQ	043065 T Cam			053531 U Aur			176.5 131 FJH		
187.4	127	FJH	188.3	92	SAQ	type Mira			type Mira			186.4 126 FJH		
201.4	131	FJH	218.3	84	SAQ	<hr/>			183.5 97 FJH			199.5 120 FJH		
214.5	131	FJH	226.4	89	SAQ	172.5 95 FJH			205.5 103 FJH			217.5 118 FJH		
233.3	136	FJH	233.4	84	SAQ	183.5 94 FJH			217.5 106 FJH			<hr/>		
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022980	RR	Cep	233.4	87	KKP	043208 RX Tau			234.5 113 FJH			060246 VY Aur		
type	Mira		242.5	86	KKP	type Mira HIP			<hr/>			type Mira		
<hr/>			<hr/>			<hr/>			<hr/>			<hr/>		
178.4	128	FJH	256.4	91	KKP	188.4 129 FJH			053538 SZ Aur			176.5 139 FJH		
187.3	126	FJH	032335 R Per			205.5 124 FJH			type Mira			186.5 143 FJH		
<hr/>			type Mira			<hr/>			<hr/>			205.5 145 FJH		

060443 RR Aur type Mira	187.5 120 FJH 225.5 134 FJH	205.5 77 FJH	074922 U Gem type UGSS+E	186.48 115 FJH 188.45 122 FJH 189.54 130 FJH 199.50 130 FJH 201.50 113 FJH 204.43 103 FJH 205.54 104 FJH 214.57 123 FJH 215.42 133 FJH 217.44 135 FJH 225.46 133 FJH 229.47 133 FJH 232.37 129 FJH 234.49 107 FJH
176.5 :146 FJH 186.4 143 FJH 205.5 137 FJH 214.6 133 FJH	062574 SU Cam type Mira HIP	189.6 :150 FJH	187.51 140 FJH 189.54 142 FJH 205.51 147 FJH 214.54 92 FJH 215.41 91 FJH 217.45 94 FJH 225.46 135 FJH 234.50 142 FJH	201.50 138 FJH 205.52 144 FJH 214.56 140 FJH 215.41 142 FJH 217.45 143 FJH 225.46 142 FJH 232.36 142 FJH 234.49 143 FJH
060450 X Aur type Mira HIP	187.5 138 FJH 214.4 128 FJH 223.3 126 FJH	071713 V Gem type Mira HIP	080362 SU UMa type UGSU	081633 T Lyn type Mira HIP
178.4 104 SAQ 188.3 100 SAQ 218.3 90 SAQ 226.4 89 SAQ 233.4 90 SAQ	063159 U Lyn type Mira	187.5 97 FJH 201.5 96 FJH 225.5 97 FJH	176.44 141 FJH 178.48 143 FJH 186.46 139 FJH 187.45 144 FJH 188.45 142 FJH 189.54 142 FJH 201.50 138 FJH 205.52 144 FJH 214.56 140 FJH 215.41 142 FJH 217.45 143 FJH 225.46 142 FJH 232.36 142 FJH 234.49 143 FJH	201.5 102 FJH
060547 SS Aur type UGSS	176.4 117 FJH 187.5 124 FJH 199.5 124 FJH 217.5 128 FJH	072708 S CMi type Mira HIP	080428 YZ Cnc type UGSU	085518 SY Cnc type UGZ
176.47 147 FJH 178.47 147 FJH 186.44 147 FJH 187.45 147 FJH 188.45 143 FJH 189.54 149 FJH 204.42:144 FJH 205.50 146 FJH 214.32 113 FJH 215.41 110 FJH 217.28 113 FJH 232.36 144 FJH 234.50 148 FJH	063444A AA Aur type Mira	205.5 75 FJH 249.5 92 HOO	187.51 122 FJH 189.55 129 FJH 201.50 125 FJH 214.56 121 FJH 215.42 127 FJH 234.50 119 FJH	234.51 111 FJH
060746A ST Aur type Mira	178.5 136 FJH 188.4 135 FJH 204.4 124 FJH 217.5 111 FJH	072811 T CMi type Mira	080523 RR Cnc type Mira HIP	093178 Y Dra type Mira
176.5 133 FJH 186.4 129 FJH 199.5 117 FJH 217.5 119 FJH 225.5 122 FJH	063558 S Lyn type Mira	187.5 144 FJH	187.5 142 FJH 234.5 126 FJH	178.4 120 FJH 189.6 126 FJH 205.5 133 FJH
061115 CZ Ori type UGSS	176.4 136 FJH 187.5 134 FJH 199.5 120 FJH 217.5 107 FJH	073234 ST Gem type Mira HIP	187.5 125 FJH 199.5 120 FJH 205.5 119 FJH 215.4 119 FJH 225.5 104 FJH	093934 R LMi type Mira HIP
186.46 131 FJH 187.51 136 FJH 189.55 153 FJH 215.42 125 FJH 217.45 123 FJH	064030 X Gem type Mira HIP	073336 RU Lyn type Mira	187.5 135 FJH 205.5 141 FJH	205.5 117 FJH 225.5 122 FJH 234.5 124 FJH
061647 V Aur type Mira HIP	186.5 130 FJH 198.4 127 FJH 215.4 123 FJH	187.5 135 FJH 205.5 141 FJH	073508 U CMi type Mira HIP	094211 R Leo type Mira HIP
186.5 125 FJH 199.5 125 FJH 217.5 125 FJH 225.5 126 FJH	064128 IR Gem type UGSU	205.5 116 FJH 225.5 121 FJH 234.5 127 FJH	080837 RT Lyn type Mira	188.7 95 BMU 199.5 91 FJH 224.3 71 KKP 242.5 62 KKP 249.5 60 HOO
061925 VV Gem type Mira	189.55 152 FJH 217.45 143 FJH	073723 S Gem type Mira	081040 W Lyn type Mira HIP	094512 X Leo type UGSS
186.5 125 FJH 199.5 125 FJH 217.5 125 FJH 225.5 126 FJH	065355 R Lyn type Mira HIP	187.5 143 FJH 205.5 138 FJH 214.5 134 FJH 225.5 129 FJH 234.5 121 FJH	187.5 120 FJH 205.5 117 FJH 225.5 113 FJH	188.66 125 BMU 234.51 131 FJH
061925 VV Gem type Mira	201.5 76 FJH	074323 T Gem type Mira	081473 Z Cam type UGZ	094735 S LMi type Mira HIP
186.5 125 FJH 199.5 125 FJH 217.5 125 FJH 225.5 126 FJH	070109 V CMi type Mira	187.5 97 FJH 201.5 102 FJH 225.5 120 FJH 234.5 130 FJH	176.45 130 FJH 178.45 133 FJH 183.50 105 FJH	205.5 128 FJH 225.5 126 FJH 234.5 128 FJH
061925 VV Gem type Mira	187.5 144 FJH 205.5 129 FJH 225.5 102 FJH	070122A R Gem type Mira HIP		
186.5 125 FJH 199.5 125 FJH 217.5 125 FJH 225.5 126 FJH	184.5 75 FJH 199.5 77 FJH			

095421 V Leo type Mira HIP	142584 R Cam type Mira	188.2 95 FJH	type Mira	183149A SV Dra type Mira
201.5 91 FJH	178.4 122 FJH	165631 RV Her type Mira	172.3 131 FJH	174.3 142 FJH
103769 R UMa type Mira HIP	143227 R Boo type Mira HIP	174.3 :151 FJH	186.3 137 FJH	186.3 144 FJH
201.5 127 FJH	181.3 :107 KKP	187.2 150 FJH	200.2 138 FJH	183225 RZ Her type Mira
214.6 128 FJH	187.4 105 KKP	165722 SY Her type Mira HIP	224.3 142 FJH	169.3 120 FJH
123160 T Ma type Mira HIP	151731 S CrB type Mira HIP	181.3 85 FJH	181031 TV Her type Mira	177.3 124 FJH
178.4 76 SAQ	181.2 83 FJH	188.3 84 FJH	174.3 :146 FJH	187.2 127 FJH
188.3 76 SAQ	205.6 78 KKP	170217 VY Her type Mira	187.2 :148 FJH	205.4 131 FJH
201.5 77 FJH	153378A S UMi type Mira HIP	174.3 130 FJH	181136 W Lyr type Mira HIP	216.2 138 FJH
218.3 82 SAQ	189.3 88 FJH	187.2 110 FJH	169.3 123 FJH	183922 AE Her type Mira HIP
226.4 85 SAQ	154536 X CrB type Mira HIP	170627A RT Her type Mira	181.4 120 FJH	169.3 113 FJH
233.4 90 SAQ	181.3 132 FJH	174.3 130 FJH	189.3 118 FJH	187.2 125 FJH
123366 RV Dra type Mira	160118 R Her type Mira	187.2 131 FJH	205.6 :109 KKP	205.2 :134 FJH
181.3 118 FJH	188.2 108 FJH	174.3 130 FJH	181306 BC Oph type Mira HIP	184134 RY Lyr type Mira
123459 RS UMa type Mira	162119 U Her type Mira HIP	187.2 131 FJH	187.3 110 FJH	172.3 130 FJH
181.3 136 FJH	181.3 117 FJH	171723 RS Her type Mira HIP	181406 AY Oph type Mira	186.3 124 FJH
123961 S UMa type Mira HIP	163137 W Her type Mira	174.3 114 FJH	187.3 115 FJH	198.2 118 FJH
181.3 103 KKP	181.3 115 FJH	187.2 105 FJH	181730 TV Lyr type Mira	184137 AY Lyr type UGSU
181.3 109 FJH	163266 R Dra type Mira HIP	172809A RU Oph type Mira	188.3 <146 FJH	181.37 131 FJH
186.3 101 KKP	172.3 105 FJH	188.3 118 FJH	182039 TW Lyr type Mira	184826 CY Lyr type UGSS
201.5 93 FJH	178.4 98 SAQ	175111 RT Oph type Mira HIP	174.3 147 FJH	174.27 134 FJH
218.3 86 SAQ	188.3 87 SAQ	187.3 119 FJH	187.3 143 FJH	187.25 139 FJH
226.4 86 SAQ	189.3 87 FJH	175519 RY Her type Mira	205.2 141 FJH	188.25 144 FJH
233.4 87 SAQ	218.3 78 SAQ	177.3 120 FJH	216.2 142 FJH	216.22 134 FJH
233.4 89 KKP	226.4 81 SAQ	175654 V Dra type Mira	182172 RT Dra type Mira	185032 RX Lyr type Mira
242.5 83 KKP	233.4 79 SAQ	183.3 122 FJH	187.3 157 FJH	187.3 157 FJH
141567 U UMi type Mira HIP	246.3 85 HOO	198.2 114 FJH	185131 SX Lyr type Mira	174.27 134 FJH
181.3 117 FJH	164012 UV Her type Mira	226.2 104 FJH	173.3 136 FJH	187.25 139 FJH
198.2 116 FJH	187.2 119 FJH	182224 SV Her type Mira	181.4 127 FJH	188.25 144 FJH
141954 S Boo type Mira HIP	164715 S Her type Mira HIP	173.3 135 FJH	198.3 123 FJH	216.22 134 FJH
181.2 95 FJH	181.3 93 FJH	187.2 131 FJH	185032 RX Lyr type Mira	185032 RX Lyr type Mira
142539 V Boo type SRa HIP	180531 T Her type Mira HIP	198.2 116 FJH	187.3 <150 FJH	185132 FF Lyr type Mira
181.3 81 KKP	172.3 123 FJH	205.4 110 FJH	185634 Z Lyr type Mira	187.3 <150 FJH
188.3 83 SAQ	187.2 129 FJH	182306 T Ser type Mira	169.3 111 FJH	181.4 108 FJH
188.4 83 KKP	198.2 128 FJH	187.3 111 FJH	181.4 108 FJH	
205.6 79 KKP	205.4 125 FJH			
218.4 86 KKP	180565 W Dra			

189.3 120 FJH	190933A RS Lyr type Mira	194027 YZ Vul type Mira	200250 BU Cyg type Mira	183.3 121 FJH
185737 RT Lyr type Mira	173.3 134 FJH	177.3 112 FJH	183.4 139 FJH	198.2 117 FJH
169.3 102 FJH	181.4 135 FJH	205.2 112 FJH	223.3 139 FJH	217.3 113 FJH
181.4 100 FJH	187.3 138 FJH	194048 RT Cyg type Mira HIP	246.3 120 HOO	226.2 115 FJH
198.3 105 FJH	190941 RU Lyr type Mira	169.5 90 FJH	200812 RU Aql type Mira	202817 Z Del type Mira
185947 WZ Lyr type Mira	181.4 131 FJH	188.3 85 FJH	183.3 126 FJH	169.4 107 FJH
174.3 149 FJH	189.3 133 FJH	194348 TU Cyg type Mira	200.2 118 FJH	183.3 114 FJH
186.3 151 FJH	205.2 141 FJH	186.3 150 FJH	224.2 108 FJH	187.3 116 HOO
190317 SV Sge type RCB	190967 U Dra type Mira	223.3 124 FJH	201008 R Del type Mira HIP	198.3 118 FJH
187.3 113 FJH	189.3 100 FJH	194604 X Aql type Mira	186.3 119 FJH	224.2 133 FJH
190333 AB Lyr type Mira	226.2 119 FJH	172.3 138 FJH	226.2 132 FJH	202954 ST Cyg type Mira
173.3 141 FJH	191046 SS Lyr type Mira HIP	186.3 142 FJH	201130 SX Cyg type Mira	169.4 100 FJH
187.3 146 FJH	173.3 139 FJH	194632 Chi Cyg type Mira HIP	177.3 95 FJH	223.3 112 FJH
190443 MV Lyr type NL	186.3 139 FJH	177.3 104 FJH	198.3 95 FJH	202962 BF Cep type Mira
169.35 127 FJH	204.3 132 FJH	188.3 95 FJH	224.3 100 FJH	176.4 145 FJH
181.39 128 FJH	224.3 129 FJH	217.3 87 BMJ	201559 CN Cyg type Mira HIP	233.2 146 FJH
186.33 127 FJH	191831 AN Lyr type Mira	218.3 84 SAQ	183.4 108 FJH	203513 SS Del type Mira
200.23 128 FJH	169.3 99 FJH	226.4 77 SAQ	201.4 116 FJH	172.3 140 FJH
224.26 128 FJH	181.4 100 FJH	195533 V482Cyg type RCB	223.3 132 FJH	183.3 134 FJH
190527 TY Lyr type Mira	187.3 107 FJH	186.3 141 FJH	233.2 139 FJH	200.2 121 FJH
173.3 142 FJH	198.3 114 FJH	224.2 136 FJH	201621 PU Vul type NL	217.3 124 FJH
181.4 :143 FJH	192928 TY Cyg type Mira	233.2 135 FJH	205.2 114 FJH	226.3 127 FJH
216.2 <142 FJH	177.3 116 FJH	195551 CM Cyg type Mira	201647 U Cyg type Mira HIP	203611 Y Del type Mira
190529A V Lyr type Mira	205.2 106 FJH	169.4 109 FJH	205.4 86 FJH	188.3 :154 FJH
169.3 119 FJH	224.2 106 FJH	183.4 110 FJH	202343 V503Cyg type UGSS	203718 HR Del type Nb
181.4 115 FJH	193311 RT Aql type Mira HIP	201.4 122 FJH	172.31 138 FJH	169.35 120 FJH
189.3 110 FJH	183.3 134 FJH	223.3 130 FJH	173.33 137 FJH	204.31 120 FJH
198.2 110 FJH	200.2 120 FJH	195818 TX Sge type Mira	174.27 139 FJH	226.25 120 FJH
216.2 114 FJH	224.2 94 FJH	177.3 132 FJH	176.40 143 FJH	203816 S Del type Mira HIP
190529B VZ Lyr type Mira	193449 R Cyg type Mira HIP	187.3 134 FJH	186.37<146 FJH	188.3 106 FJH
169.3 110 FJH	169.4 117 FJH	205.2 :147 FJH	187.32<150 FJH	246.3 88 HOO
181.4 116 FJH	183.3 120 FJH	195849 Z Cyg type Mira HIP	202509 RY Del type Mira	203847 V Cyg type Mira HIP
189.3 116 FJH	200.2 124 FJH	177.3 135 FJH	188.3 <155 FJH	183.5 104 FJH
198.2 119 FJH	223.3 130 FJH	201.3 137 FJH	202512 RX Del type Mira	205.4 104 FJH
216.2 128 FJH	193509 RV Aql type Mira	223.3 136 FJH	172.3 126 FJH	2039-05 Y Aqr type Mira
190643 ST Lyr type Mira	183.3 127 FJH	246.3 127 HOO	181.3 131 FJH	187.3 131 FJH
186.3 :148 FJH	200.2 135 FJH			

203918 ES Del type Mira	2105-04 RS Aqr type Mira	177.3 115 FJH 189.3 105 FJH 201.3 96 FJH 214.3 94 FJH 226.3 102 FJH	214443 WY Cyg type Mira	177.29 128 FJH 181.39 127 FJH 183.31 126 FJH 186.34 127 FJH 201.32 126 FJH 204.31 128 FJH 205.24 127 FJH 211.32 110 FJH 214.31 107 FJH 215.41 108 FJH 216.23 109 FJH 217.26 111 FJH 226.26 127 FJH
183.3 128 FJH 204.3 125 FJH 226.3 117 FJH	187.3 123 FJH		189.4 100 FJH 200.4 102 FJH 211.3 109 FJH 232.3 112 FJH	201.32 126 FJH 204.31 128 FJH 205.24 127 FJH 211.32 110 FJH 214.31 107 FJH 215.41 108 FJH 216.23 109 FJH 217.26 111 FJH 226.26 127 FJH
204016 T Del type Mira	210612 AN Peg type Mira	177.3 109 FJH 189.3 111 FJH 200.2 111 FJH 217.3 119 FJH 233.3 125 FJH	212610 UU Peg type Mira	201.3 107 FJH 223.3 116 FJH 233.3 124 FJH
173.3 143 FJH 183.3 140 FJH 200.2 132 FJH 217.3 126 FJH 226.2 125 FJH 246.3 119 HOO	210812 R Equ type Mira	188.3 85 FJH 205.4 84 FJH	215605 V Peg type Mira	222129 RV Peg type Mira
		213678 S Cep type Mira HIP	178.3 100 FJH 188.3 105 FJH 201.3 107 FJH 223.3 116 FJH 233.3 124 FJH	181.4 149 CMG 187.3 146 FJH 204.4 132 FJH 226.3 114 FJH
2041-04 W Aqr type Mira	169.4 109 FJH 178.3 117 FJH 186.4 123 FJH 200.2 126 FJH 216.2 132 FJH 226.2 137 FJH	213843 SS Cyg type UGSS	215934 RT Peg type Mira	222439 S Lac type Mira HIP
181.3 129 FJH 187.3 127 FJH		169.35 118 FJH 172.40 82 FJH 176.41 101 FJH 183.34 113 FJH 187.32 118 FJH 187.34 116 HOO 189.38 117 FJH 197.32 117 FJH 198.40 118 FJH 199.45 118 FJH 205.28 118 FJH 211.32 118 FJH 214.32 118 FJH 217.26 86 FJH 217.28 85 BMU 223.32 82 FJH 224.26 83 FJH 226.24 83 FJH 232.32 113 FJH 246.33 120 HOO 248.30 120 HOO 249.36 117 HOO	181.4 108 FJH 200.4 112 FJH 226.3 130 FJH	169.4 97 FJH 183.5 104 FJH 198.4 108 FJH 205.4 111 FJH 223.3 122 FJH
204318 V Del type Mira	210818 AS Peg type Mira	214012 TU Peg type Mira HIP	220133B RZ Peg type Mira HIP	222924 SS Peg type Mira HIP
188.3 <154 FJH		172.3 127 FJH 183.3 132 FJH 189.3 132 FJH 204.3 135 FJH 226.2 137 FJH	172.3 125 FJH 187.3 121 FJH 200.4 119 FJH 226.3 112 FJH	169.4 91 FJH 183.3 92 FJH 198.4 94 FJH 205.4 98 FJH 224.3 105 FJH
204341 V516Cy type UGSS	173.3 153 FJH 186.3 153 FJH 204.3 :153 FJH 233.3 141 FJH		220412 T Peg type Mira	169.4 91 FJH 183.3 92 FJH 198.4 94 FJH 205.4 98 FJH 224.3 105 FJH
186.37 136 FJH 187.32 137 FJH 188.27 142 FJH 233.23 138 FJH	210836 DU Cyg type Mira	214012 TU Peg type Mira HIP	169.4 98 FJH 183.3 97 FJH 197.3 97 FJH 205.4 101 FJH 226.3 108 FJH	169.4 91 FJH 183.3 92 FJH 198.4 94 FJH 205.4 98 FJH 224.3 105 FJH
2044-05 T Aqr type Mira HIP	205.3 115 FJH	2109-03 RR Aqr type Mira	220613 Y Peg type Mira	223841 R Lac type Mira
188.3 77 FJH		178.3 124 FJH 187.3 133 FJH	186.4 119 FJH 200.2 103 FJH 214.3 103 FJH 232.3 111 FJH	169.4 96 FJH 183.5 93 FJH 198.4 93 FJH 205.4 93 FJH
205017 X Del type Mira	178.4 67 SAQ 179.5 65 HIL 186.4 66 HIL 214.4 88 HIL 233.4 82 HIL	2109-03 RR Aqr type Mira	220714 RS Peg type Mira HIP	224517 SX Peg type Mira HIP
173.3 147 FJH 186.3 147 FJH 204.3 147 FJH 216.2 141 FJH 233.2 134 FJH		172.3 127 FJH 183.3 132 FJH 189.3 132 FJH 204.3 135 FJH 226.2 137 FJH	169.4 117 FJH 178.3 120 FJH 186.4 123 FJH 200.2 126 FJH 214.3 128 FJH 226.3 131 FJH	172.3 120 FJH 181.4 117 FJH 200.4 109 FJH
210382 X Cep type Mira	211614 X Peg type Mira	214024 RR Peg type Mira		225542 SZ And type Mira
178.4 104 FJH 189.3 107 FJH 200.4 114 FJH 217.4 115 FJH 229.5 118 FJH	172.3 136 FJH 186.4 137 FJH 200.2 135 FJH 217.3 127 FJH 226.3 118 FJH	172.3 138 FJH 181.4 124 FJH 197.3 104 FJH 205.4 102 FJH 224.3 97 FJH	220912 RU Peg type UGSS	173.3 150 FJH 186.3 153 FJH 233.3 :157 FJH
210405 RR Equ type Mira	212216 TV Peg type Mira		172.32 127 FJH 176.40 128 FJH	
186.3 145 FJH				

225914 RW Peg type Mira	176.41 143 FJH 186.37 144 FJH 188.47 145 FJH 204.35 143 FJH 233.25 144 FJH	187.3 124 FJH 187.4 125 VRI 200.4 127 FJH 211.3 129 FJH 226.3 130 FJH
169.4 113 FJH 178.3 107 FJH 188.3 103 FJH 198.4 101 FJH 217.3 103 FJH 232.3 107 FJH	232642 BG And type Mira	235855A Y Cas type Mira
230110 R Peg type Mira HIP	172.3 122 FJH 183.3 117 FJH 200.4 103 FJH 217.4 97 FJH 232.3 101 FJH	169.4 108 FJH 181.5 102 FJH 189.4 104 FJH 204.4 104 FJH 217.4 114 FJH 229.5 116 FJH
172.5 115 FJH 178.3 115 FJH 188.3 117 FJH 201.3 121 FJH 214.3 125 FJH 226.3 125 FJH	232848 Z And type Z And	235939 SV And type Mira HIP
230759 V Cas type Mira HIP	181.5 107 FJH 201.5 107 FJH	172.4 109 FJH 181.4 100 FJH 188.3 93 FJH 199.4 94 FJH 224.3 95 FJH
2338-15 R Agr type Mira HIP	246.3 71 HOO	
183.5 104 FJH 188.3 99 SAQ 201.5 95 FJH 218.3 78 SAQ 226.4 77 SAQ 233.4 80 SAQ	233956 Z Cas type Mira	
231425 W Peg type Mira HIP	187.3 148 FJH 204.4 147 FJH	
172.5 127 FJH 187.3 127 FJH 200.4 123 FJH 211.3 122 FJH 232.3 116 FJH	235053 RR Cas type Mira	
231508 S Peg type Mira HIP	181.5 149 FJH 188.3 149 FJH 204.4 140 FJH 217.4 129 FJH 229.5 122 FJH	
188.3 76 FJH 205.4 82 FJH	235255 WY Cas type Mira	
231817 IP Peg type UGSS+E	169.5 89 FJH 183.3 95 FJH 200.4 95 FJH 229.5 103 FJH	
226.26 130 FJH	235350 R Cas type Mira HIP	
231839 BU And type Mira	169.4 122 FJH 188.3 125 FJH 201.3 125 FJH 217.4 116 FJH 229.5 115 FJH 249.5 108 HOO	
172.3 126 FJH 183.3 126 FJH 200.4 124 FJH 217.4 124 FJH 232.3 121 FJH	235525 Z Peg type Mira HIP	
232543 DX And type UGSS	172.4 118 FJH 181.4 123 FJH	
173.34 144 FJH		