

British Astronomical Association – Past/Present/Future

UK Occultation Studies pre-2010

with some highlights from

Titan – 28 Sagittarii Event in 1989

+

First +ve UK Asteroid Occultation in 1996

Richard Miles

Occultations - Early BAA History

BAA Journal: Index of Occultation-related articles, 1940 October to 1990 December

Occultations

- 78, 87; 81, 16; 86, 425
- by
 - Charon, 90, 528
 - comet Halley, 96, 118
 - Doris, 90, 207
 - Lucinda, 92, 194
 - Mars, 62, 241
 - minor planets, 62, 176; 94, 17
 - Prediction, 65, 84
 - Recent results, 89, 119
 - Pallas, 88, 438
 - 1973 February 6, 83, 170
 - Philomena, 87, 222
 - planets and their satellites, 82, 223
 - Uranus, 83, 352; 87, 336
 - Venus, 58, 28, 226; 91, 116
- observed in blue light and the problem of the Moon's atmosphere, 66, 257
- of
 - 28 Sgr by Titan, 1989 July 3, 99, 157; 100, 263
 - BAA observers capture Titan's spectacular occultation, 99, 205
 - Photographing, 99, 214
 - a series of five stars, 82, 431
 - AGK3 +12° 0218 by Mars, 1985 March 17, 95, 230
 - asteroids, 62, 177
 - BD +15° 450 by Mars, 1958 August 25, 69, 294
 - BD +21° 397, 64, 161
 - β Scorpii by
 - Io, 82, 13
 - Jupiter and Io on 1971 May 13 and 14, 82, 200

- Photometric observation, 83, 172
- bright stars by
 - planets, 70, 174
 - the eclipsed Moon, 85, 17
- close binaries, 83, 143, 167
- Crab Nebula by the Sun, 69, 287
- ϵ Arietis, 64, 161
- ϵ Geminorum by
 - Mars, 1976 April 8, 86, 33, 272; 87, 196
 - Mercury, 1953 June 11, 63, 157, 357
 - κ Geminorum by Eros, 1975 January 23/24, 8494
- Mars
 - 1948 January 28, 58, 70
 - 1972 May 15, 82, 144
- planets by the eclipsed Moon, 87, 135
- Pleiades on 1953 March 19, 63, 118
- Regulus by
 - Neptune, 71, 123
 - Venus, 1959 July 7, 69, 32, 258, 284; 70, 70
- Saturn
 - 1962 November 4, 72, 225; 73, 90
 - 1974 March 2-3, 84, 446; 85, 285, 452
- σ Arietis by Jupiter, 62, 300; 63, 120, 190
- Spica, 1976 December 16, 86, 424
- Venus
 - 1949 August 26, 60, 19
 - 1959 November 27, 70, 106
 - 1980 October 5, 90, 57, 92, 132, 199
 - by the Sun in 1984, 94, 86
- 1854 March 5, 99, 7
- 1945, 55, 34, 53
- Analysis of total lunar occultations made in the years 1943 to 1974, 91, 14

Fading

- at occultations, 82, 255, 282; 83, 35
- occultations of stars by the Moon, 1943-1977, 94572
- Theory, 85, 420; 86, 87
- Grazing occultations, 94, 78
- 1971, 80, 474
- of
 - 139 Tauri, 1972 March 21, 83, 9, 272
 - a 6.8-magnitude star, 73, 244
 - ξ Sagittarii, 1974 October 21, 87, 57
 - ZC 620 on 1964 February 20, 75, 48, 72
- Another successfully observed, 76, 188
- Network of observers, 83, 125
- News & Notes, 93, 218; 94, 30
- Observations during the lunar eclipse of 196-December 19, 78, 28
- Observing, 66, 194, 196, 198; 82, 285, 457; 88563; 94, 237
- grazing occultations, 90, 304
- Planetary occultations
 - 1970, 80, 216
 - of bright stars, 91, 148
 - Mutual occultations of planets, 80, 282; 98, 165
- Possible occultation of
 - a star by Io, 81, 268, 303
 - κ Geminorum by Eros, 85, 201

Prediction

- and analysis, 96, 302
- of occultations by the Earth as seen from a geostationary satellite, 91, 473
- using a microcomputer, 95, 132
- Geographical correction, 90, 263
- Semi-graphical method, 65, 290
- Simplified method, 67, 252
- Preliminary investigations into the causation of unusual occultation phenomena, 83, 356
- Reappearances, 66, 265; 80, 70; 82, 46
- Reductions, 51, 73; 60, 36
 - 1940, 51, 366
 - 1941, 52, 251
 - 1942 elements, 52, 47
 - 1943, 57, 31
 - 1944, 58, 92
 - 1945-46, 60, 102
 - 1947, 61, 69
- Timing, 88, 415; 91, 245, 512
- Unexpected use for observations, 62, 122
- Work, 83, 34; 93, 226

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Lunar Occultations

Occultation Newsletter

Volume VI, Number 7 J

1981 Tally of Lunar O

Table I, Part A

Value	Name	Country		
478.9	BRIAN LOADER	NEW ZEALAND		
398.0	B.F. SINCHESKUL	USSR		
366.4	ROBERT H. HAYS JR.	USA		
341.8	N.P. WEITH-KNUDSEN	DENMARK		
291.0	THOMAS W. LANGHANS	USA		
283.7	34 OBSERVERS	GDR		
239.3	PETER E. ANDERSON	AUSTRIA		
228.8	M. DANIEL OVERBEEK	SOUTH AFRICA		
213.4	NOEL T. MUNFORD	NEW ZEALAND	PALMERSTON NORTH	132 72
158.8	M. MATTHEWS	NEW ZEALAND	AUCKLAND	91 60
132.4	MIECZYSTAW SZULC	POLAND	TUCHOLA	77 49
121.6	ADRIANO FILIPPONI	ITALY	ROME	99 20
121.6	PAUL V. MCBRIDE	USA	GREEN FOREST, AK	99 20
114.4	JEAN BOURGEOIS	BELGIUM	FUROOZ	76 34
113.1	RICHARD W. LASHER	USA	CHINA LAKE, CA	60 47
104.0	RICHARD WAYNE BALDRIDGE	USA	MOUNTAIN VIEW, CA	95 8
86.0	HENK J.J. BULDER	NETHERLANDS	ZOETERMEER	69 15
76.0	ANDREW J. ELLIOTT	ENGLAND	LEEDS, W. YORKSHIRE	41 31
71.1	JAMES H. VAN NULAND	USA	SAN JOSE, CA	70 1
69.3	NEAL D. BLACKBURN	USA	KANSAS CITY, MO	49 18
67.2	LIONEL E. HUSSEY	NEW ZEALAND	CHRISTCHURCH	48 17
62.8	ROBERT L. SANDY	USA	KANSAS CITY, MO	47 14



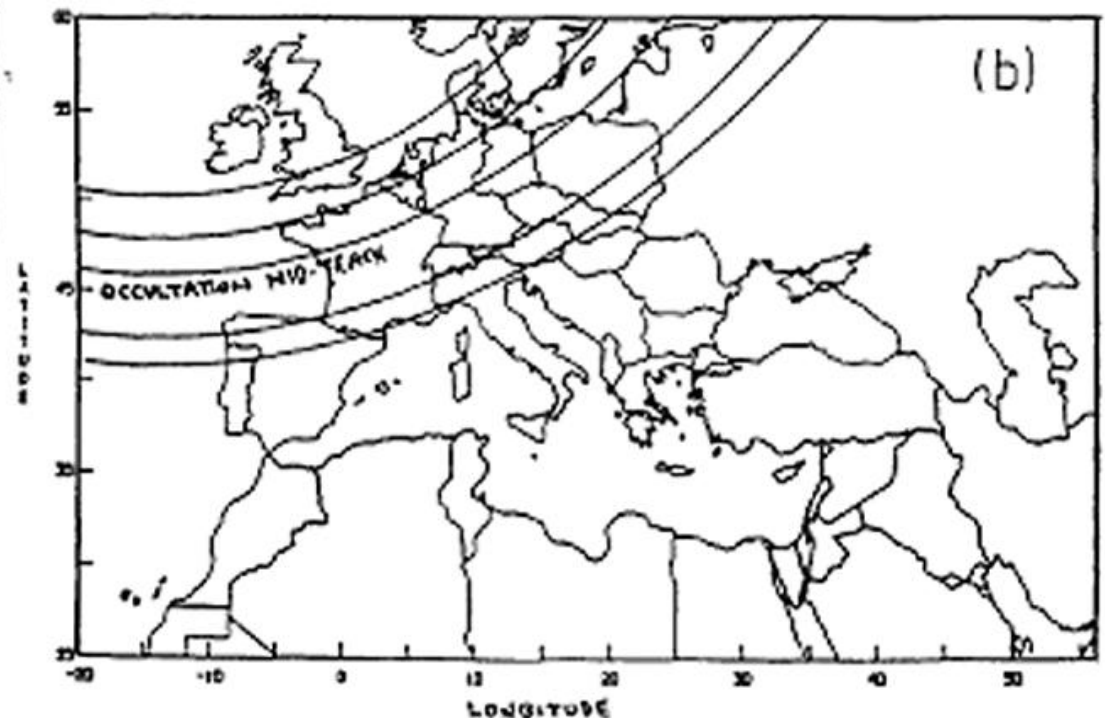
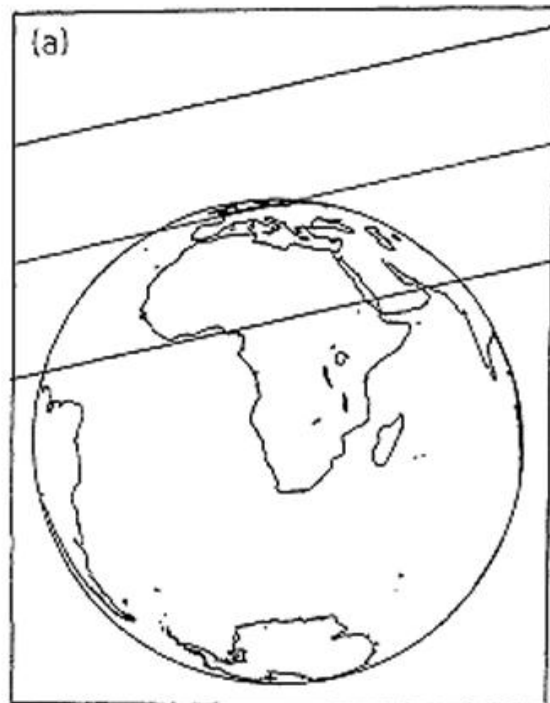
Andrew Elliott

The occultation of 28 Sagittarii by Titan

Richard Miles & Andrew J. Hollis

A report of the Asteroids and Remote Planets Section (Director: A. J. Hollis)

A report is presented of the occultation of 28 Sagittarii by Titan on 1989 July 3. Visual, video and photoelectric observations, some depicting a central flash event, are reported. The optical characteristics of Titan's upper atmosphere (300–700km altitude) are derived. It is postulated that the distribution of light in the central flash pattern exhibits dispersion as a function of wavelength, and that one unfiltered CCD video recording contains features indicative of absorption by methane. An upper limit for the diameter of 28 Sgr is determined.



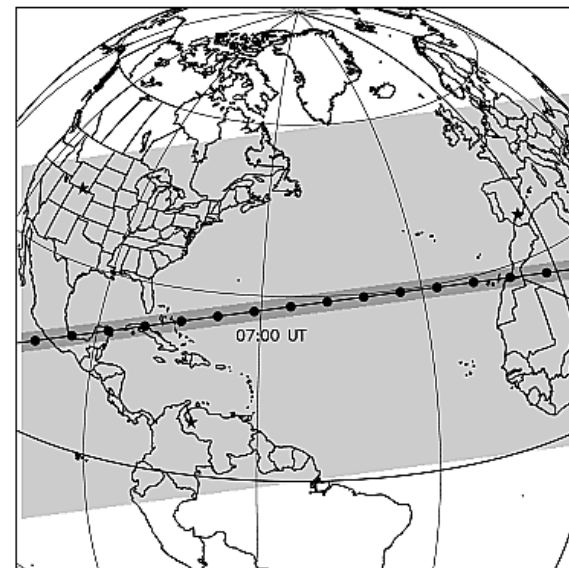
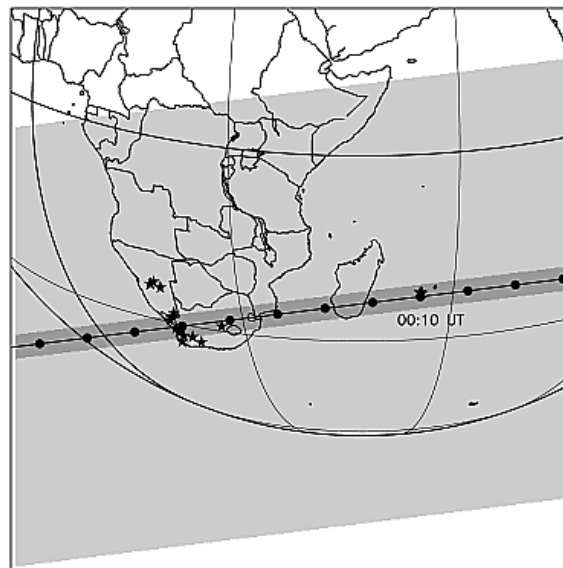
The two Titan stellar occultations of 14 November 2003

B. Sicardy, F. Colas, T. Widemann, A. Bellucci, W. Beisker, M. Kretlow,
F. Ferri, S. Lacour, J. Lecacheux, E. Lellouch, S. Pau, S. Renner, F. Roques,
A. Fienga, C. Etienne, C. Martinez, I. S. Glass, D. Baba, T. Nagayama,
T. Nagata, S. Itting-Enke, K.-L. Bath, H.-J. Bode, F. Bode, H. Lüdemann,
J. Lüdemann, D. Neubauer, A. Tegtmeier, C. Tegtmeier, B. Thomé, F. Hund,
C. deWitt, B. Fraser, A. Jansen, T. Jones, P. Schoenau, C. Turk, P. Meintjies,
M. Hernandez, D. Fiel, E. Frappa, A. Peyret, J.-P. Tenc, M. Vignand, C. Hestro,
T. Payet, R. R. Howell, M. Kidger, J. L. Ortiz, M. Rapaport

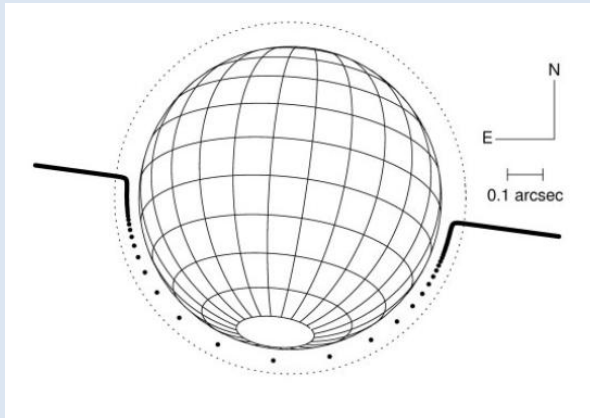


View issue TOC
Volume 111, Issue E11
November 2006

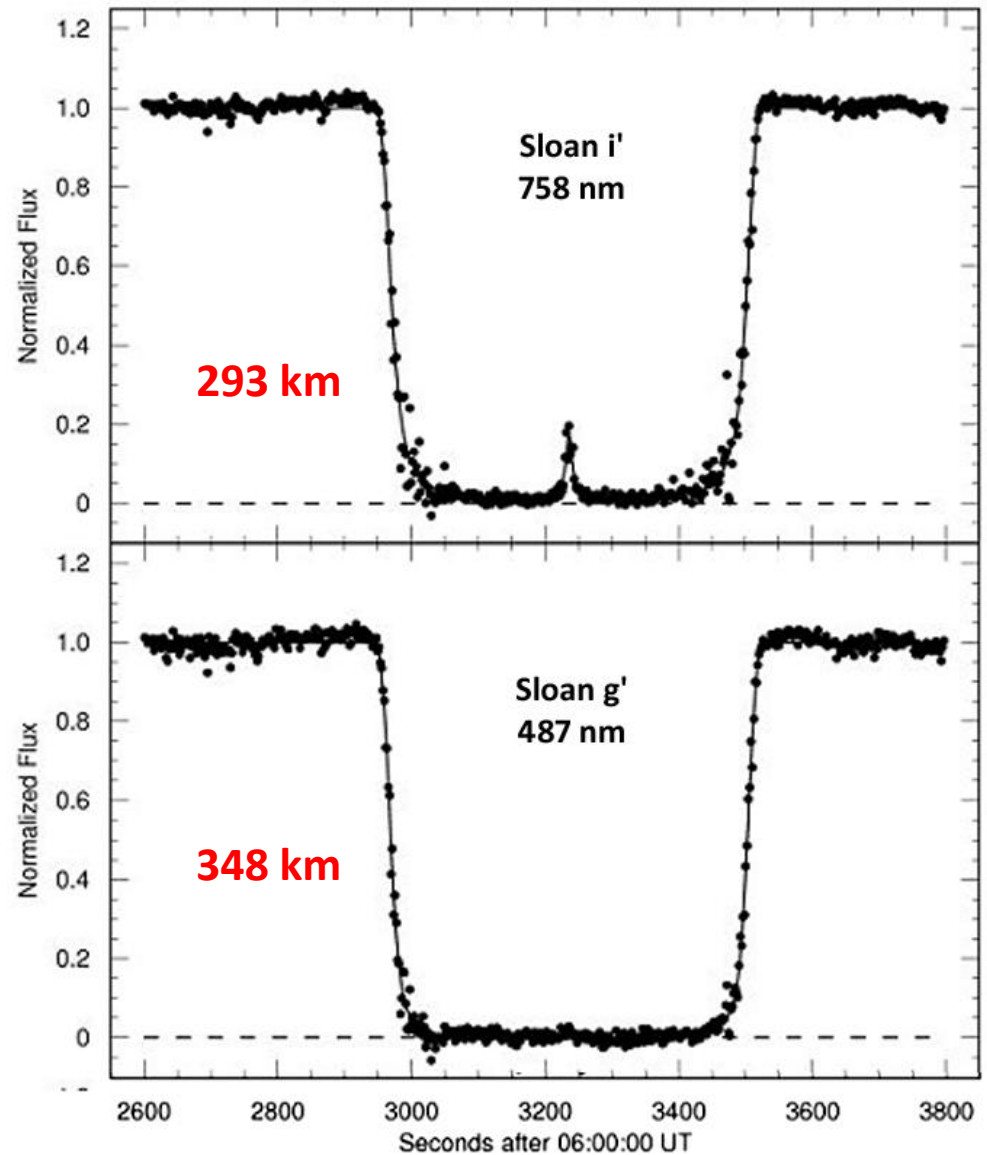
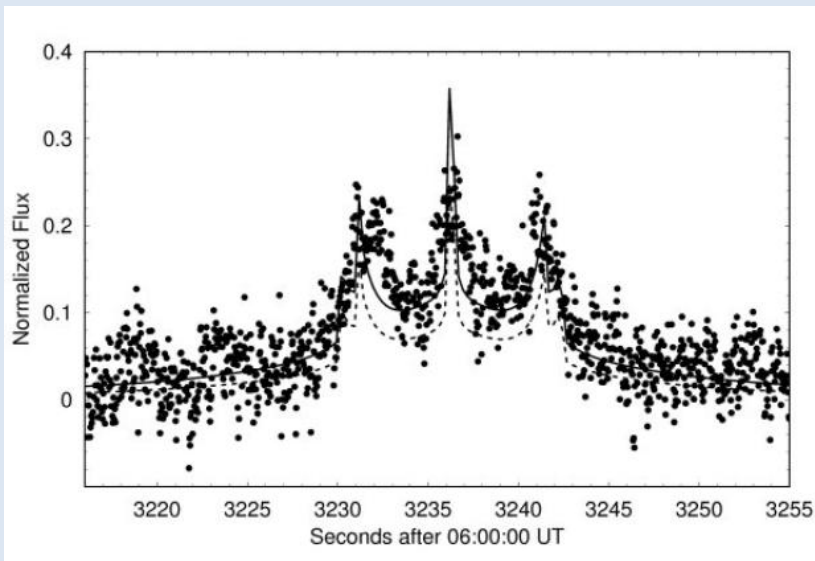
On 14 November 2003, Titan occulted two bright stars of the Tycho catalog: TYC 1343-1615-1 ($V = 8.6$) and TYC 1343-1865-1 ($V = 10.7$). The first occultation was visible right after midnight (UT) from the Indian Ocean and the southern half of Africa, while the second one was observable about seven hours later from western Europe, the Atlantic Ocean, and northern and central Americas; see [Figures 1, 2, and 3](#).



Titan Occultations: 2003 Nov 14

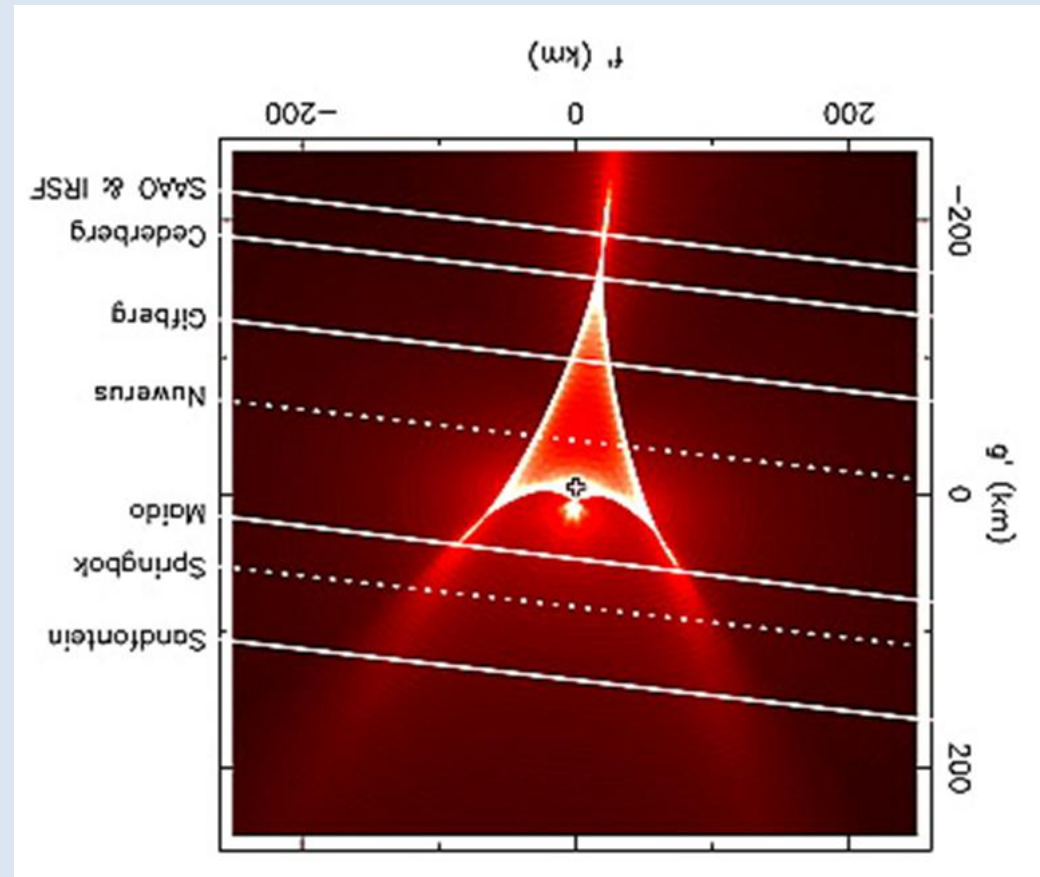
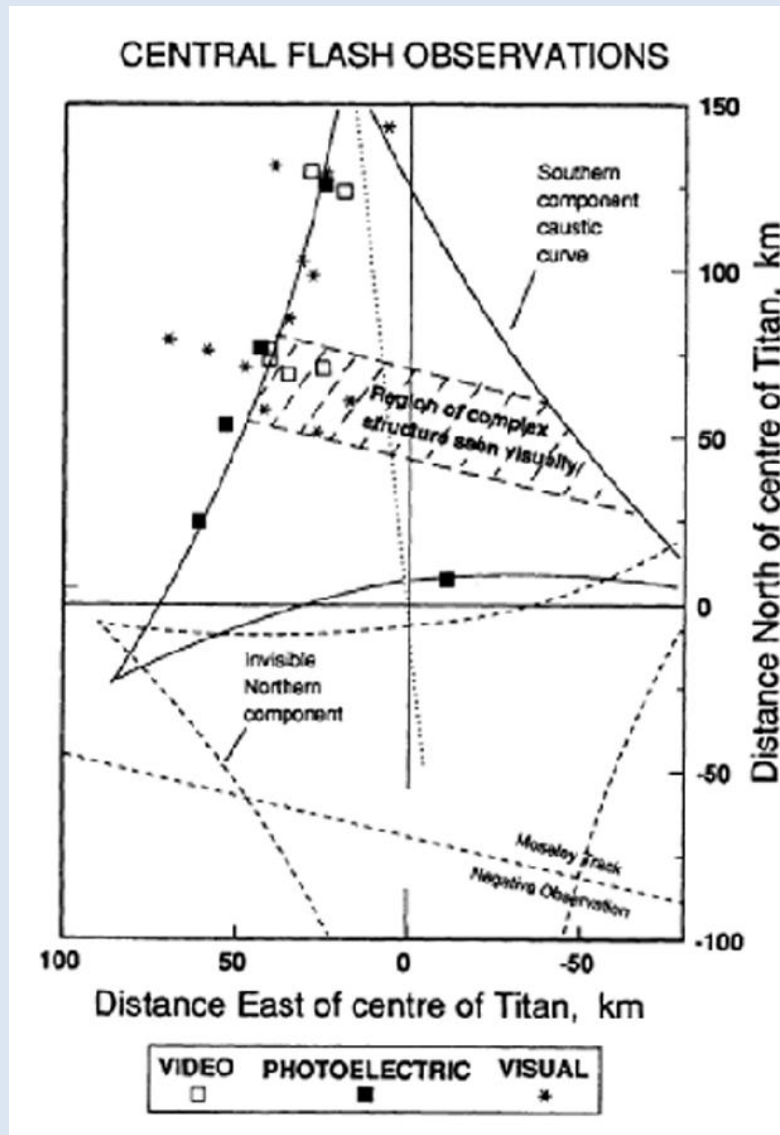


4.2-m WHT, La Palma

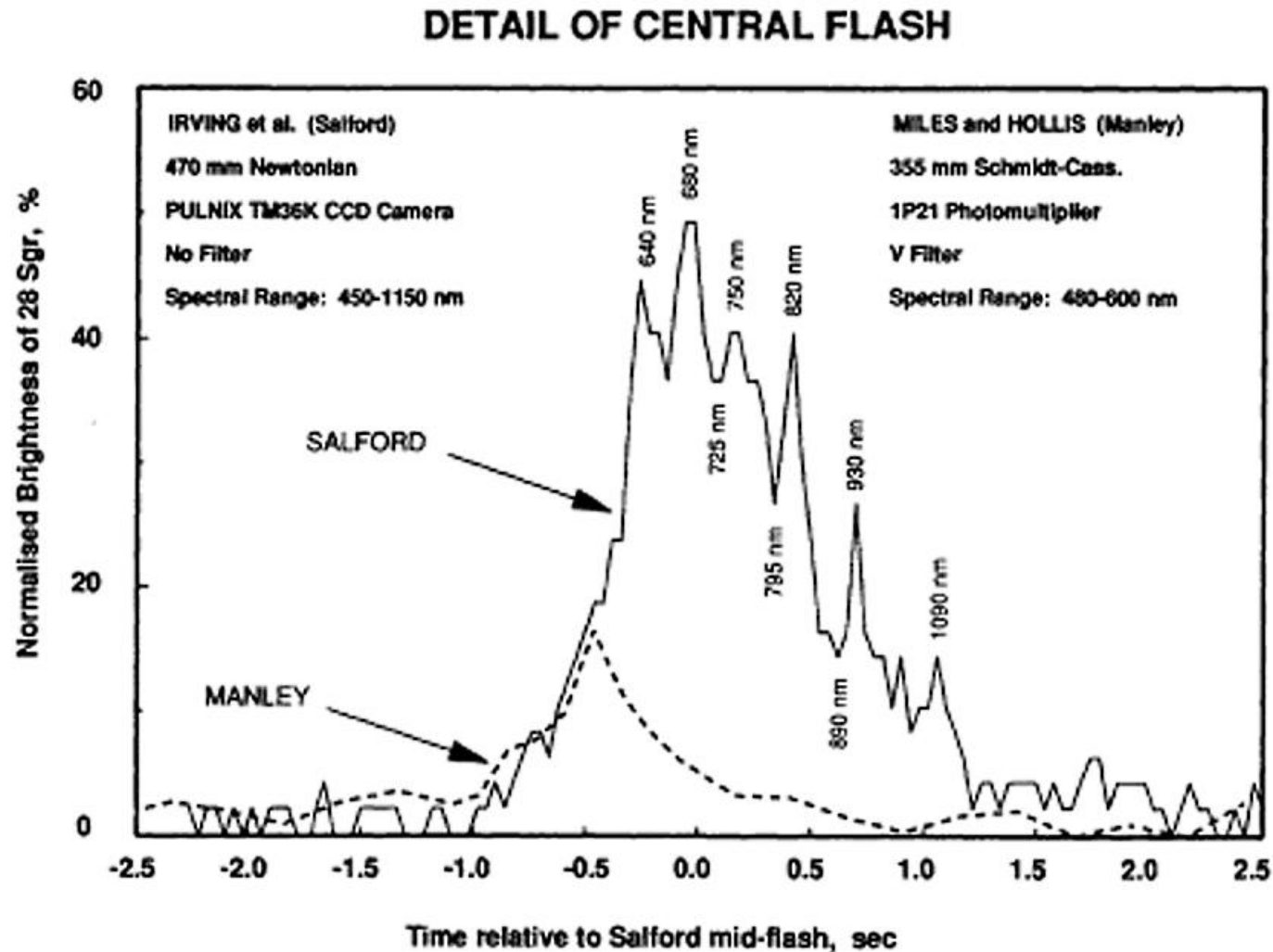


1989 Jul 03

2003 Nov 14



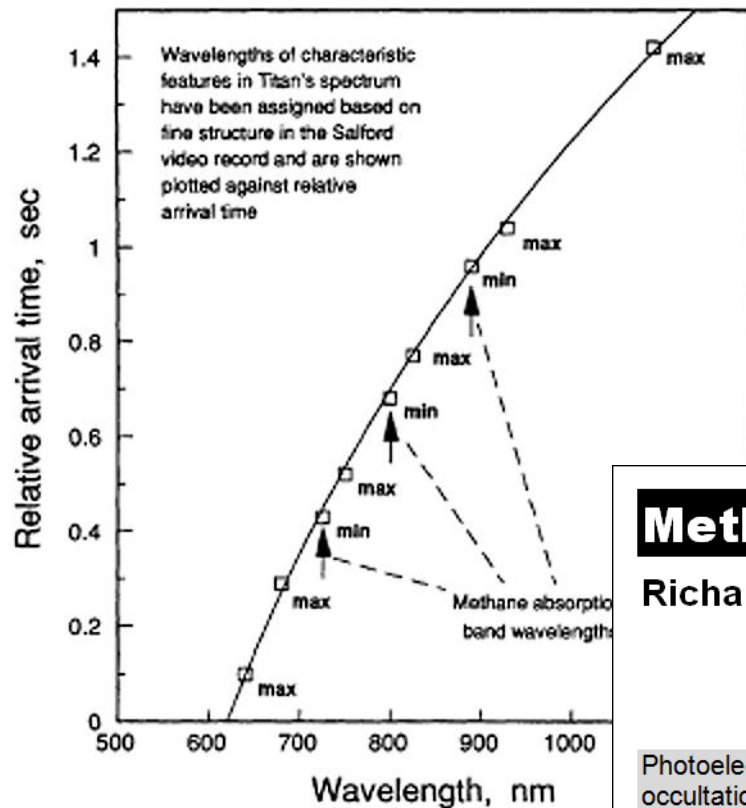
Titan Occultation: 1989 Jul 03



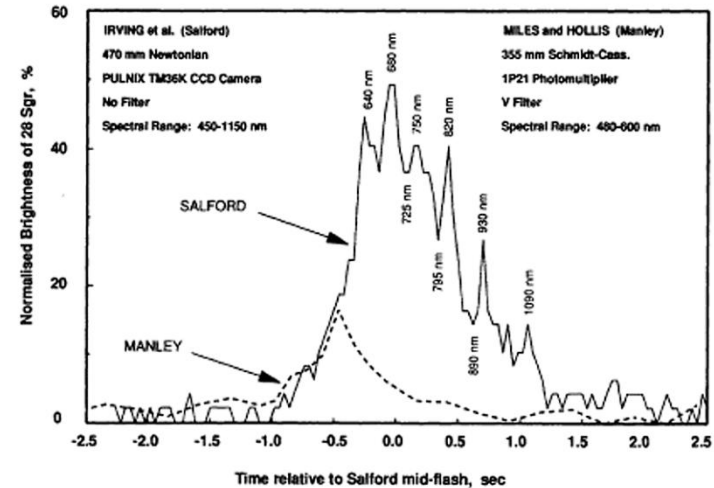
Titan Occultation: 1989 Jul 03

CENTRAL FLASH CHARACTERISTICS

Correlation with spectral features



DETAIL OF CENTRAL FLASH



Methane abundance in Titan's stratosphere

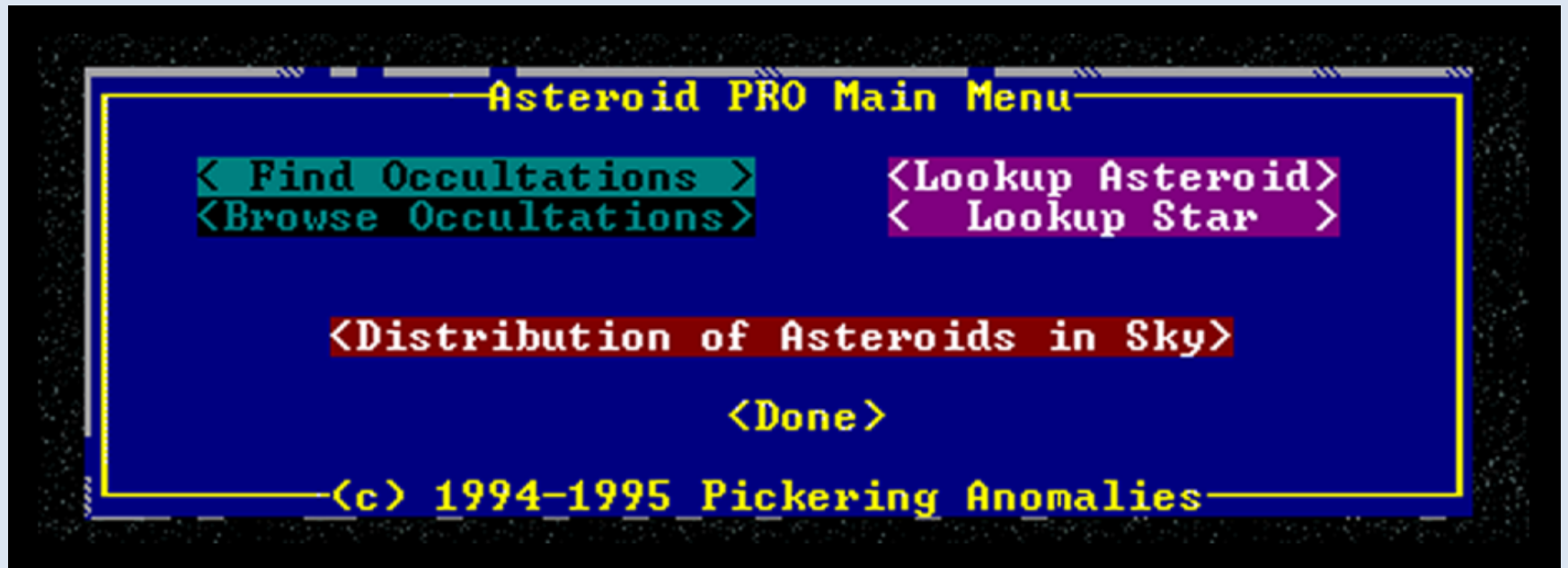
Richard Miles

A report of the Asteroids and Remote Planets Section (Director: Andrew J. Hollis)

Photoelectric and CCD video observations of the central flash observed during the 1989 July 3 occultation of 28 Sgr by Saturn's largest satellite, Titan, have been analysed. By comparing the form of the central flash trace recorded from Salford with that from Manley, it has been shown that the flash exhibits chromatic dispersion and that features in the Salford trace can be assigned to characteristic spectral absorption bands of methane. Analysis of the relative intensity of the strong absorption band at 880-900 nm, when combined with the atmospheric pressure vs. altitude data previously derived from the analysis of the ingress/egress phase of the occultation published by Sicardy et al., has yielded a value of 7 mole-% for the methane concentration in Titan's upper atmosphere although values ranging from 5-10 mole-% also fit the observations within the experimental uncertainties.

Occultation Monitoring in the 1990s

Asteroid Pro software



Installation requirements: **80386** or better, **3 MB RAM** minimum, **DOS 5.0** or better, **color** monitor, **40 MB** disk space,

Asteroid Pro software

Search Screen

APP

Pick Asteroids

Search Range

Star Catalogs

Browsing Options

Filters

Done

Search Star Catalog for Occultation

Filters

AstMag 0.0 17.0
StarMag 13.5
[X] SunElong>30
[] Local Horizon

[] IOTA Visual
Q 0.0
AngDiam 0.00"
MagnDrop 0.0
ShadDur 0.0s

Hits

0
0
0
0
0
0
0
0

Time Span

Year 1995+-
Month 5+-
[] +Remaining

Star Catalog

< > PPM [X] PM
< > SAO
< > GSC
< * > UOB ----->
Appulse <=18"

UOB Files

[INSTALL]
[OBJECTS]
[PPMFILE]
▶ASTPRO.U

Examine Events...

Use Event Set A
< * > At Search <No Set>
< > Later <Fresh Set>
< > Later <Append Set>

Asteroids Examined

Group: From 74 To 74
Current Galatea 74
Dist Diam" Diam Magn
0.000 .000 123.0 0.0
Current
Group
Month

<Begin>

Halt at End of
[] i-Immediate
[] a-Asteroid
[] m-Month

<Done>

Stars Examined

Current

Accum/Mo

Total

0

0

~0.5°

0

0

~0.5'

0

0

~1.2EarRad

0

0

Last Appulse/Occul

0d 0h

0.0"

Occultations

0

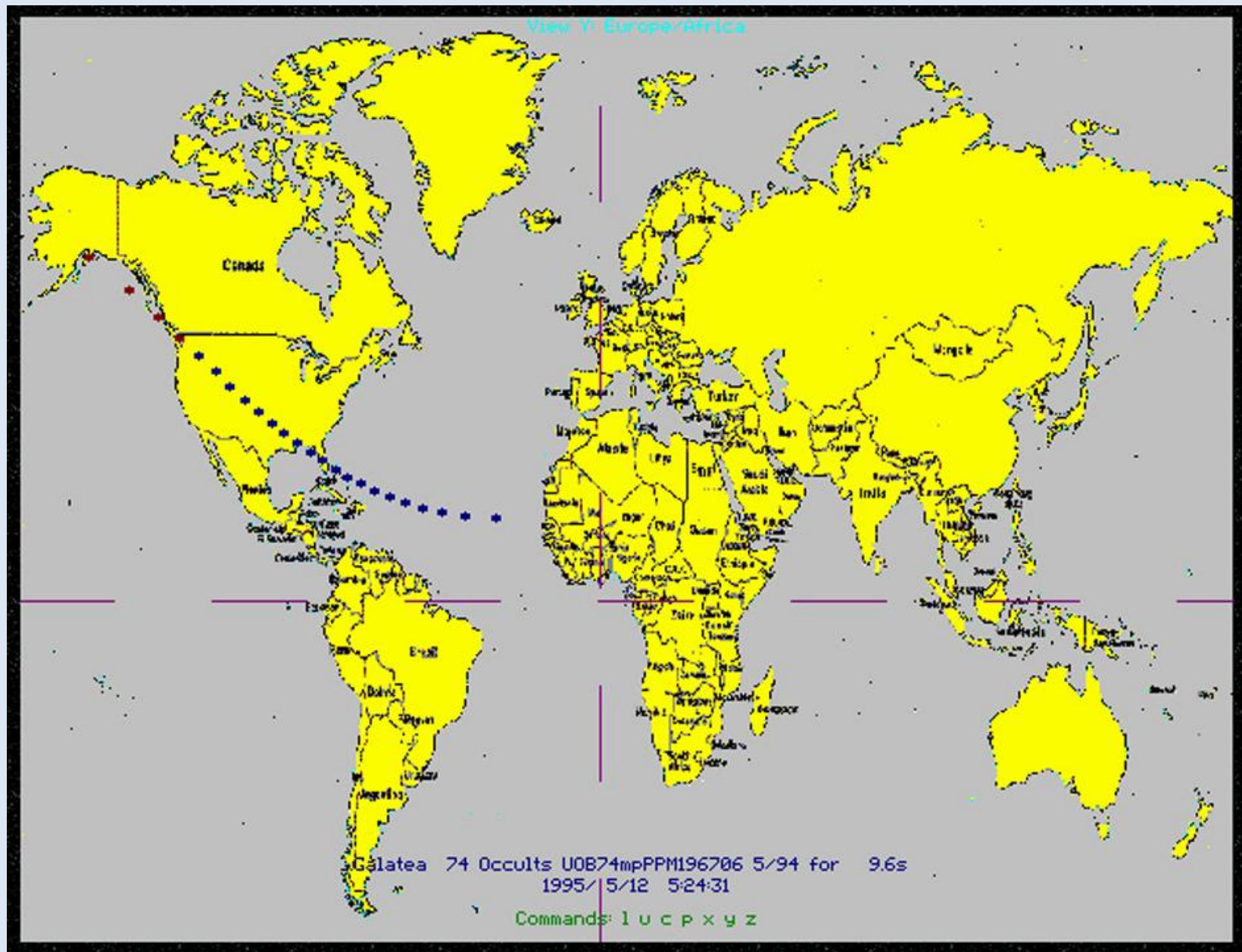
0

Asteroid Pro software

Occultation Event

Observer	GeneralOpts	SkyPlotOpts	EarthPlotOpts	Done
View Occultation & Ephemeris				
Name Galatea ID 74 Time 1995/ 5/12 5:24:28.0 RA 13h38m11.20s Dec 8°35'27.85" <ET> 2449849.7253283 <•> Geo < > Topo		Time Steps Time Dir [X] + <Single Step> < > Automatic <Reverse Dir> < > Reference <Multi Step> <•> Refined <Find Closest> Orbit Age 0.7d <Refine> Interval 10d ^C to Stop		
[X] Occultation Target Active Sun-154.7° ID 0B74mpPPM196706 5/94 Sp VisMagn-9.9 RA 13h38m11.137s DEC 8°35'30.09" MagDrop 9.9		Upd <•> Sngl <Refine> Rate < > Cont Interval 10d <Done> ^C to Stop		
<Earth Plot> < Sky Plot > Shadow Relative to Earth Separ 0.678R 0° 0' 2.46" Minimum 0.681R <Reset> 0° 0' 2.46" Time 2449849.7253283 1995/ 5/12 5:24:28.0		Yes Shadow on Earth EarthFigure Longitude 86.49°W Latitude 30.02°N Location Florida, USA < Step Path > StopIf@ Target Site [] Enabled No Target Site < Save Path > inFile PATHFILE [] NewFile [] SnglStep PathStep 30s [] PathEdges Limit Speed 12.8 Enter Darkness Nighttime -18.0° Duration 9.5 HorzAngle 47.11° 10°		

Asteroid Pro software - Shadow Track



BAA Asteroid Occultation Predictions 1995-1999

OCCULTATIONS OF STARS BY ASTEROIDS VISIBLE FROM THE UK PREDICTIONS FOR THE PERIOD, NOV 1996

Predictions generated using *Asteroid Pro Version 2.0* and verified using *Guide Version 5.0*

Dates given are as the 'double-date', e.g. the night of Oct 28/29

dm = drop in brightness of star in magnitudes

dt = approx. maximum duration of the main-body occultation

Alt = altitude above the horizon (for latitude 52deg North)

V = approx. combined magnitude of star + asteroid

Moon Phase = % illuminated, Moon Sep. = angular separation between the asteroid and the Moon

Stars are identified by name and J2000 coordinates

Double Date Nov	Time UT	Asteroid Name	Dimensions Diam. / Shadow	dm mag	dt	Alt (52(N))	Name
4/5	22:19-22:35	3224 Irkutsk	35 km / (45 km)	4.2	2s	51 deg	CMC 802883
5/6	04:36-04:56	467 Laura	48 km / (55 km)	4.0	5s	62 deg	GSC 1941 00254
8/9	01:46-02:06	892 Seeligeria	79 km / (260 km)	3.6	7s	18 deg	GSC 4695 00543
10/11	18:00-18:20	3596 Meriones	44 km / (90 km)	6.5	8s	29 deg	PPM 207237
10/11	23:13-23:43	112 Iphigenia	76 km / (170 km)	5.6	19s	27 deg	SAO 79765
15/16	22:54-23:14	131 Vala	43 km / (70 km)	3.4	8s	38 deg	GSC 1882 00432
15/16	23:53-00:13	84 Klio	83 km / (90 km)	1.7	12s	64 deg	GSC 2309 01381
24/25	00:48-01:04	260 Huberta	101 km / (130 km)	5.1	9s	51 deg	GSC 0729 00163
28/29	20:22-20:42	2307 Garuda	45 km / (80 km)	6.6	5s	36 deg	PPM 173829
30/31	21:50-22:10	752 Sulamitis	66 km / (90 km)	1.7	7s	50 deg	GSC 1273 00248

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V = approx. combined magnitude of star + asteroid

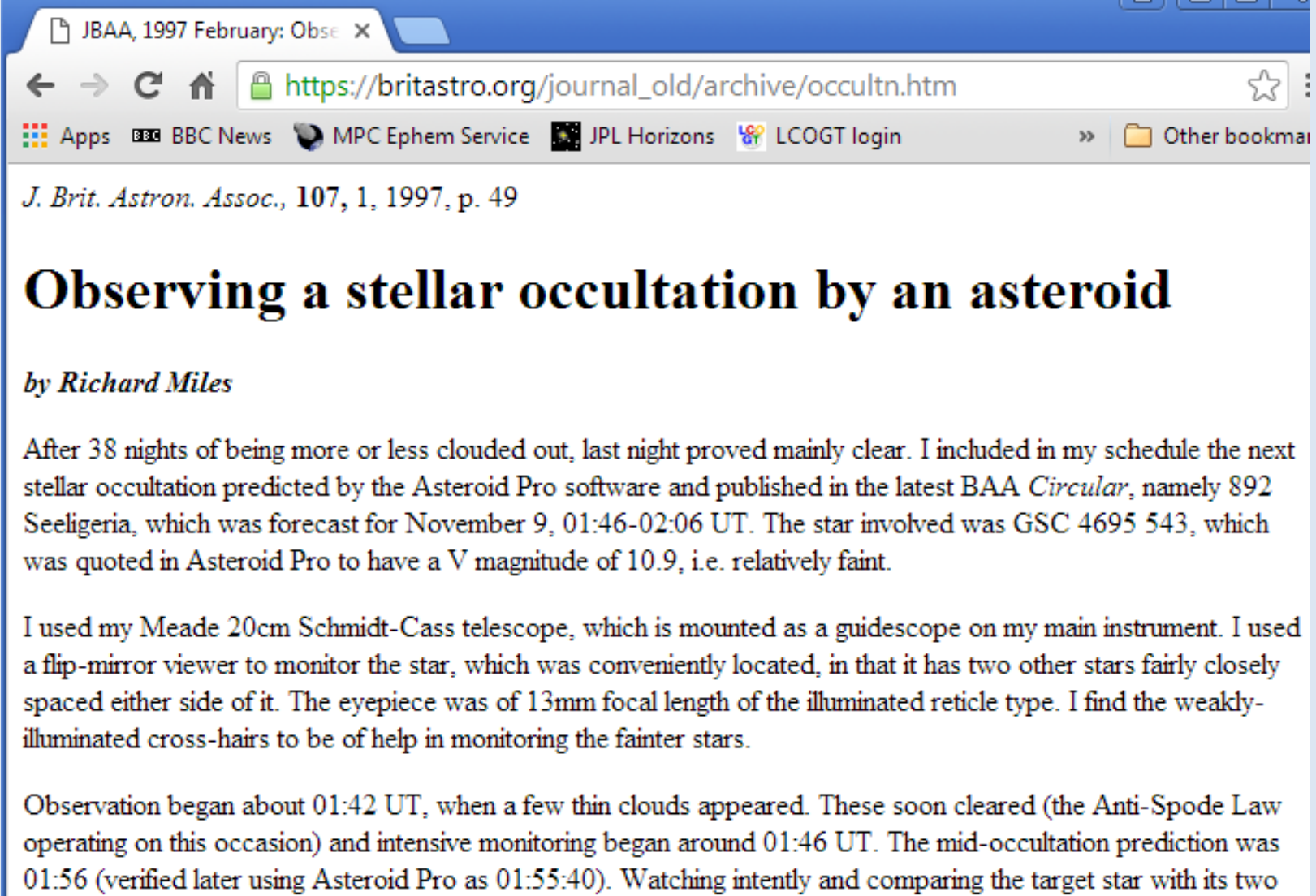
Moon Phase = % illuminated, Moon Sep. = angular separation between the asteroid and the Moon

Stars are identified by name and J2000 coordinates

Double Date	STAR		MOON		
	RA	Dec	V	Phase	Sep.
Nov					
4/5	2h 48m 47s	+16deg 420' 31"	11.8	35%	Set
5/6	8h 22m 36s	+24deg 33' 57"	11.5	24%	44 deg
8/9	2h 2m 10s	-7deg 26' 08"	10.9	4%	Set
10/11	23h 10m 48s	-5deg 11' 26"	10.2	0%	Set
10/11	7h 52m 49s	+23deg 29' 58"	8.7	0%	Set
15/16	6h 24m 59s	+25deg 11' 58"	10.7	26%	Set
15/16	2h 07m 43s	+31deg 33' 21"	10.4	26%	Set
24/25	6h 02m 25s	+14deg 47' 14"	10.1	100%	48 deg
28/29	23h 10m 55s	+3deg 17' 54"	9.9	86%	120 deg
30/31	4h 30m 31s	+18deg 52' 56"	11.3	70%	65 deg

First positive asteroid occultation timing

892 Seeligeria



The image is a screenshot of a web browser window. The address bar shows the URL https://britastro.org/journal_old/archive/occultn.htm. The browser's bookmark bar contains several links: 'Apps', 'BBC News', 'MPC Ephem Service', 'JPL Horizons', 'LCOGT login', and 'Other bookmarks'. The page content is from the 'J. Brit. Astron. Assoc.' journal, issue 107, 1, 1997, page 49. The article title is 'Observing a stellar occultation by an asteroid' by Richard Miles. The text describes the observation of the occultation of star GSC 4695 543 by asteroid 892 Seeligeria on November 9, 1997. The observer used a Meade 20cm Schmidt-Cass telescope and a flip-mirror viewer. The observation began at 01:42 UT, and the mid-occultation prediction was 01:56 UT.

J. Brit. Astron. Assoc., 107, 1, 1997, p. 49

Observing a stellar occultation by an asteroid

by *Richard Miles*

After 38 nights of being more or less clouded out, last night proved mainly clear. I included in my schedule the next stellar occultation predicted by the Asteroid Pro software and published in the latest BAA *Circular*, namely 892 Seeligeria, which was forecast for November 9, 01:46-02:06 UT. The star involved was GSC 4695 543, which was quoted in Asteroid Pro to have a V magnitude of 10.9, i.e. relatively faint.

I used my Meade 20cm Schmidt-Cass telescope, which is mounted as a guidescope on my main instrument. I used a flip-mirror viewer to monitor the star, which was conveniently located, in that it has two other stars fairly closely spaced either side of it. The eyepiece was of 13mm focal length of the illuminated reticle type. I find the weakly-illuminated cross-hairs to be of help in monitoring the fainter stars.

Observation began about 01:42 UT, when a few thin clouds appeared. These soon cleared (the Anti-Spode Law operating on this occasion) and intensive monitoring began around 01:46 UT. The mid-occultation prediction was 01:56 (verified later using Asteroid Pro as 01:55:40). Watching intently and comparing the target star with its two

The End

el Fin

Das Ende

La Fin

Het einde

Konec

Fine

Koniec

Y diwedd