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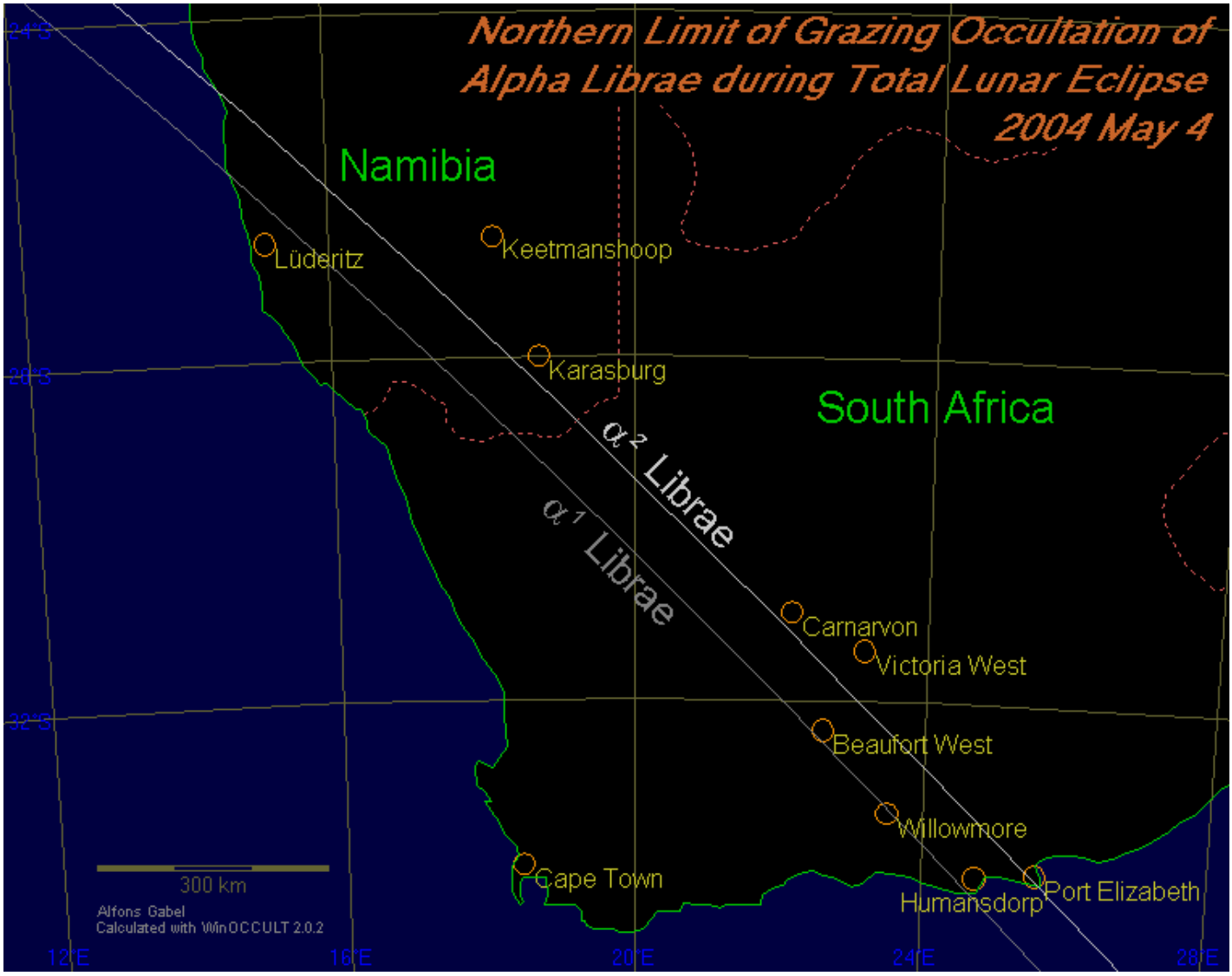

African Graze of Alpha Librae in May 2004

In this Issue

ON THE COVER:

Grazelines of the African Graze of Alpha Librae in May 2004

Graphic courtesy of Alfons Gabel

Publication Date for this issue:
April 2004

Please note: The date shown on the cover is for subscription purposes only and does not reflect the actual publication date.

The next issue, Volume 10, Number 4 will be published in May. Please send submissions for that issue to Editor_ON@straight2you.net no later than 20 May 2004.

What to Send to Whom

Send new and renewal memberships and subscriptions, back issue requests, address changes, email address changes, graze prediction requests, reimbursement requests, special requests, and other IOTA business, but **not observation reports**, to:

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Stillwater, OK 74074 USA
Email: **business@occultations.org**

Send *ON* articles and editorial matters (in electronic form) to:

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Osawa-2, Mitaka-shi
Tokyo 181-8588, Japan
Email: **SomaMT@cc.nao.ac.jp**

Send interesting stories of lunar grazing occultations to:

Richard P. Wilds
2541 SW Beverly Court
Topeka, Kansas 66611-1114 USA
Email: **astromaster@cox.net**

Send Total Occultation and copies of Lunar Grazing Occultation reports to:

International Lunar Occultation Centre (ILOC)
Geodesy and Geophysics Division
Hydrographic Department
Tsukiji-5, Chuo-ku
Tokyo, 104-0045 Japan
Email: **iloc@jodc.go.jp**

Send Asteroidal Appulse and Asteroidal Occultation reports to:

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Email: **h.j.jbulder@freeler.nl**

Membership and Subscription Information

All payments made to IOTA must be in United States funds and drawn on a US bank, or by credit card charge to VISA or MasterCard. If you use VISA or MasterCard, include your account number, expiration date, and signature. (Do not send credit card information through e-mail. It is neither secure nor safe to do so.) Make all payments to **IOTA** and send them to the Secretary & Treasurer at the address on the left. Memberships and subscriptions may be made for one or two years, only.

Occultation Newsletter subscriptions (1 year = 4 issues) are US$20.00 per year for USA, Canada, and Mexico; and US$25.00 per year for all others. Single issues, including back issues, are 1/4 of the subscription price.

Memberships include the *Occultation Newsletter* and annual predictions and supplements. Memberships are US$30.00 per year for USA, Canada, and Mexico; and US$35.00 per year for all others. Observers from Europe and the British Isles should join the European Service (IOTA/ES). See the inside back cover for more information.

IOTA Publications

Although the following are included in membership, nonmembers will be charged for:

Local Circumstances for Appulses of Solar System Objects with Stars predictions US$1.00
Graze Limit and Profile predictions US$1.50 per graze.
Papers explaining the use of the above predictions US$2.50
IOTA Observer's Manual US$5.00

Asteroidal Occultation Supplements will be available for US$2.50 from the following regional coordinators:
South America--Orlando A. Naranjo; Universidad de los Andes; Dept. de Fisica; Mérida, Venezuela
Europe--Roland Boninsegna; Rue de Mariembourg, 33; B-6381 DOURBES; Belgium or IOTA/ES (see back cover)
Southern Africa--Brain Fraser - fraserb@intekom.co.za
Australia and New Zealand--Graham Blow; P.O. Box 2241; Wellington, New Zealand
Japan--Toshiro Hirose; 1-13 Shimomaruko 1-chome; Ota-ku, Tokyo 146, Japan
All other areas-Jan Manek; (see address at left)

ON Publication Information

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African Graze of Alpha Librae in May 2004

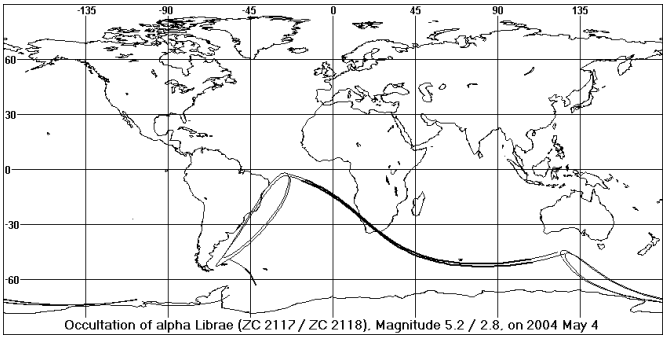
Alfons Gabel

On 2004 May 4, five weeks before the transit of Venus, there will be another amazing astronomical event: A grazing occultation of Alpha Librae - amidst a Total Lunar Eclipse!

David Dunham referred to this "once in a lifetime" event after I listed the upcoming occultations of Alpha Librae without noticing this remarkable coincidence. Thereafter I received some requests for more detailed data, which are prepared now:

Alpha Librae is a 4' wide common proper motion pair consisting of Alpha-1 Librae = ZC 2117 = 8 Librae (F3, 5.2 mag) and Alpha-2 Librae = ZC 2118 = Zubenelgenubi (A3, 2.8 mag).

Both occultation zones will widely cover the southern parts of the Atlantic and the Indian Ocean, and Antarctica



Occultation of alpha Librae (ZC 2117 / ZC 2118), Magnitude 5.2 / 2.8, on 2004 May 4

The only land area where this naked eye graze will be observable is Namibia and South Africa.

Both northern limit lines run parallel without a close approach or even intersection. Therefore it is not possible to observe the grazes of both components, because from any point on the graze line of Alpha-1 the graze of Alpha-2 will take place just 7 to 8 minutes later, but at a distance of about 70 km in northeastern direction.

As seen from the graze line of Alpha-1, the brighter Alpha-2 will disappear a moment before Alpha-1's central graze, and will reappear 17 to 18 minutes thereafter. Both stars are suspected binaries, so striking gradual or step events even of alpha-2 may occur during such an oblique occultation. At the alpha-2 graze line no occultation of alpha-1 will occur. ■

Visit IOTA on the WWW at:
www.lunar-occultations.com/iota/iotandx.htm

and IOTA • ES at:
http://www.iota-es.de

In Memoriam - Macpherson Morgan, 1917 - 2002

Macpherson Morgan (he preferred to be known just as "Mac Morgan") organized occultation observations, both grazes and asteroidal, for IOTA for many years in northern New Mexico.

He was born on March 12, 1917. Mac was a nuclear physicist/chemist for the Atomic Energy Commission while serving in the U. S. Air Force. He was also a test pilot, and a SAC (Strategic Air Command) pilot, too. When he retired from the Air Force in 1965, he went to work for Stanford Research Institute in Menlo Park, Calif, and later transferred to their Hunstville, ALabama office. When he retired from SRI in about 1970, he and his wife, Patty, moved back to Albuquerque to be close to their daughter, Phyllis; her husband; and their children (Mac's grandchildren). From then on he was extremely active with the astronomical society and the spin-off group, Los Amigos de las Estrellas. He was equally active in his church work (at the national level) plus square dancing and skiing.

This was written from information obtained by IOTA member Bruce Levin, some of which he obtained from Mac's daughter, Phyllis. Mac was a long time member in The Albuquerque Astronomical Society. When Bruce joined the group in late 1982, Mac was President of the then called Albuquerque Astronomers. The group had about 35 members and met in members' homes. The club grew and started meeting in classrooms at the University of New Mexico Physics and Astronomy Building. Mac was active for many years holding office and board member positions. The AA finally incorporated as The Albuquerque Astronomical Society (TAAS) a non-profit scientific organization in 1988. Mac was one of the signers on the Society's Articles of Incorporation initiating the formation of TAAS. Mac remained active as a board member for many years as a TAAS member. Col. Macpherson Morgan (ret. USAF) organized numerous lunar graze and asteroid occultation expeditions within the state of New Mexico and submitted results of his and participants' timings to IOTA. Mac was also active in TAAS public and school star parties; site location, planning, and construction of the Society's General Nathan Twining Observatory (GNTO); Astronomy Day activities, the UNM Campus Observatory open house observing sessions for the public, and special astronomical events organized by TAAS for the public such as lunar eclipses, comet apparitions, and planet oppositions. As an aside, Bruce wrote: "Patty made the best chocolate chip cookies and Mac diligently plotted graze and occultation paths for the stars and asteroids."

Mac was married to Patty for over 60 years. Patty passed away suddenly on September 19, 2002. Mac passed away on May 28, 2002, in Gillette, Wyoming, where Phyllis now lives. Mac is survived by two daughters, 5 grandchildren, and 5 great grandchildren.

The Probable Duplicity Of Lambda Aquarii – Observational Evidence

Hal Povenmire

On December 7, 1997, there was an exceptionally favorable grazing occultation of ZC 3353, or Lambda Aquarii. This M2III spectral class star is a Red Supergiant (RSG) and would be expected to show distinctive dimming phenomena during an occultation. What was unexpected was that after mid-graze, the events showed pronounced dimming phenomena, but with a stairstep pattern. A graphical solution shows this almost always occurred at the position angle of approximately 210º. The probable companion was estimated to be of magnitude +6.5 with a separation of approximately 0.2 arc second. This is almost certainly an indication that the star is a previously undetected binary. This now presents a problem because speckle interferometry has not, at this time, been able to split this large diameter star into components. The following is a list of similar magnitude Red Supergiant stars which have been well observed in fairly similar conditions and have shown dimming phenomena but not the stairstep phenomena.

Star Cross Reference

Name	Z.C.	SAO	D.M.	HIP	PPM
Lambda Aquarii	3353	146362	-8 5968	112961	206868
Iota Capricorni	3126	164346	-17 6245	105515	238745
Aldebaran	692	94027	16 629	21421	102261
Antares	2366	184415	-26 11359	80763	265579
46 Capricorni	3185	145637	-9 5829	107382	205561
Upsilon Geminorum	1149	79533	27 1424	36962	97726
Kappa Capricorni	317	164593	-19 6152	107188	239234
30 (YY) Piscium	3536	147042	-6 6345	154	181772
71 (Tau 2) Aquarii	3349	165321	-14 6354	112716	240808
5 Tauri	508	93469	12 486	16369	119139
Delta Tauri	648	93897	17 712	20455	199835
91 (Psi 1) Aquarii	3419	146598	-9 6156	114855	207344

Physical Data

In the following table, the first column gives the name of the star. The second column gives the approximate magnitude. The third column gives the spectral class. The fourth column gives the date of observation or discovery. The fifth column gives the percentage sunlit that the Moon was, and whether it was waxing or waning. The sixth column gives the cusp angle of central graze. The seventh column gives the number of times of events observed or videotaped. The eighth column gives the angular diameter of the star in arc seconds.

Name	Mag	Spec	Date	Moon	C.A.	Times	Dia
Lambda Aquarii	3.7	M2III	12-07-97	46X	5.8	259	.0083
Iota Capricorni	4.3	G8III	12-04-70	29X	17.4	235	.002
Aldebaran	1.1	K5III	09-22-78	67N	1.1	87	.0208
Antares	1.2	M11 ab	01-25-68	22N	17.4	27	.0388
46 Capricorni	5.3	G8II	12-01-92	38X	14.2	178	.0018
Upsilon Geminorum	4.2	K5III	09-17-87	27N	9.0	24	.0063
Kappa Capricorni	4.8	G8III	01-02-87	11X	20.9	20	.0016
30 (YY) Piscium	4.4	M3III	01-18-02	24X	16.9	66	.0069
71 (Tau 2) Aquarii	4.2	M0III	12-21-01	32X	13.8	8	.0062
5 Tauri	4.3	K0III	06-21-98	10N	3.0	24	.003
Delta Tauri	3.9	K0III	04-21-96	9X	4.6	71	.0028
91 (Psi 1) Aquarii	4.5	K0III	02-08-02	6X	8.7	26	.0010

In summary, we have reviewed about 1025 events from large angular diameter stars observed under very favorable conditions. This shows that gradual dimming phenomena are common and to be expected. We know from these observations what large diameter stars, singular and binary, should look like during grazing occultations. Stairstep phenomena are essentially unknown with single stars. With Lambda Aquarii, the stairstep phenomena were common with both visual observations and videography. Approximately 38 percent of the events were stairstep, especially on the Reappearances.

The fact that the stairstep phenomena were almost predictable and consistent with many observers in different position angles makes the duplicity of Lambda Aquarii the most believable solution. The only other reason that I can conceive of is that perhaps Lambda Aquarii has a greatly extended atmosphere similar to the chromosphere or corona of the Sun, and this created the observed phenomena. It is my prediction that with improved speckle interferometry, this star will be resolved as a binary.

I wish to thank Richard Nugent of Houston, TX for his mathematical computations and review of this paper.

References:

(1) *Povenmire, H. (1998) Lambda Aquarii Is A Binary Star! Occultation Newsletter Vol. 7 No. 2 July p. 18.*

(2) *Povenmire, H., Craven, B., and Bookamer, R. (1997) A Spectacular Grazing Occultation And A New, Bright Binary Star, Lambda Aquarii IAPPP Communication No. 69 Fall p. 38.*

(3) *Pasinetti-Fracassini (2001) Catalogue of Stellar Diameters (CADARS) Astronomical Data Center Catalogue # 2224 2001 Astronomy & Astrophysics Vol. 367 p. 521.*

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Information from IOTA/ES

Dr. Eberhard Bredner, Secretary

1) Business meeting Hannover - April 3, 2004

The board of officers needed to be re-elected . The assembly re-confirmed the old officers and gave them a vote of confidence for another two year term. The contact information in Occultation Newsletter remains up to date.

2) ESOP XXIII – Paris – August 27-29, 2004

For more information please visit:

http://calys.obspm.fr/~ESOP2004/

Conference program

Welcome evening
Friday, Aug 27 2004, 18:00-22:30
Observatoire de Paris,
Entrance 77 avenue Denfert-Rochereau,
F-75014 Paris

Welcome, pre-registration and buffet reception (buffet starts at 19:30) will take place in historical Salle Cassini of Observatoire de Paris, on the Paris Meridian.

Scientific program (preliminary)
Saturday and Sunday, August 28-29, 2004
Institut d'Astrophysique de Paris

The symposium will take place at Institut d'Astrophysique de Paris (IAP) main amphitheater. IAP is located a short walk from Observatoire de Paris main historical building.

Entrance during the sessions will be either 98 bis, Boulevard Arago, F-75014 Paris, or 77 avenue Denfert-Rochereau, F-75014 Paris.

Saturday, August 28
9:00-10:45
Session I : Minor planets

Coffee break

11:15-13:00
Session II : Occultations

Lunch

14:00-15:45
Session III : Technical developments

Coffee break

16:15-18:00
Session IV : Venus transitSunday, August 29

9:00-10:45
Session V : Mutual phenomena (Phemus)

Coffee break

11:15-13:00
Session VI : Predicting events and collecting data

Lunch

14:00-15:45
Special lectures

3) ESOP 2005 and beyond

We now have decided on further possibilities regarding where to hold future meetings:

- ESOP XXIV 2005 - Finland
- ESOP XXV 2006 - The Netherlands - *25th anniversary of ESOP*
- ESOP XXVI 2007 : ??? Spain ??? Mallorca ???

3) Workshop in Regensburg

Our video and webcam workshop in Regensburg is now scheduled for Friday, May 21st. Participants should get in contact with the secretary as quickly as possible to get the latest information regarding costs, accommodations (if necessary), etc.

4: Contact Information Needed

Please, we need the e-mail addresses for our members. If you are not sure that the secretary has your current email address, please send a short message to: secretary@iota-es.de ■

In Memoriam - Ed Wallner

It is with sadness that we report that Edward P. Wallner, Jr. passed away on November 1, 2002. He was a long-time member of the Amateur Telescope Makers of Boston and author of the tide prediction software "TIDES". Ed was an avid astronomer and shared his joy of astronomy with numerous schoolchildren during his years. He will be sorely missed. ■

IOTA's Mission

The International Occultation Timing Association, Inc. was established to encourage and facilitate the observation of occultations and eclipses. It provides predictions for grazing occultations of stars by the Moon and predictions for occultations of stars by asteroids and planets, information on observing equipment and techniques, and reports to the members of observations made.

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IOTA European Section (IOTA·ES)

Observers from Europe and the British Isles should join IOTA/ES, sending a Eurocheck for EURO 20,00 to the account IOTA/ES; Bartoldknaust Strasse 8; D-30459 Hannover, Germany; Postgiro Hannover 555 829-303; bank code number (Bankleitzahl) 250 100 30. German members should give IOTA/ES an "authorization for collection" or "Einzugs-Ermaechtigung" to their bank account. Please contact the Secretary for a blank form. Full membership in IOTA/ES includes one supplement for European observers (total and grazing occultations) and minor planet occultation data, including last-minute predictions; when available. The addresses for IOTA/ES are:

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IOTA on the World Wide Web

(IOTA maintains the following web sites for your information and rapid notification of events.)

IOTA Member Site
http://www.occultations.org

This site contains information about the organization known as IOTA and provides information about joining IOTA and IOTA/ES, topics related to the *Occultation Newsletter*, and information about the membership--including the membership directory.

IOTA Lunar Occultations, Eclipses, and Asteroidal and Planetary Occultations Site
http://www.lunar-occultations.com

This site contains information on lunar occultations, eclipses, and asteroidal and planetary occultations and the latest information on upcoming events. It also includes information explaining what occultations are and how to report them.

IOTA's Telephone Network

The Occultation Information Line at 301-474-4945 is maintained by David and Joan Dunham. Messages may also be left at that number. When updates become available for asteroidal occultations in the central USA, the information can also be obtained from 708-259-2376 (Chicago, IL).