

THE FOCAL POINT

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TABLE OF CONTENTS

Grazing Occultation Events for 1989	1
The Casual Astronomer: January 1989	2
Grazing Occultation Report	3
Classified Ads	4

CLUB CALENDAR

Next Meeting: January 20, 8:00 p.m. at Bradley Observatory.
Program: Richard Jakiel will present a talk entitled "Observing Galactic Structure."

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The Focal Point is published monthly during the academic year by the Atlanta Astronomy Club, Inc. The AAC is a non-profit organization dedicated to the advancement of amateur astronomy. Meetings are held the third Friday of each month (except the second Friday in December) at the Bradley Observatory on the Agnes Scott campus. Dues are \$25 annually for a single membership and \$30 for a family membership and include a subscription to Sky & Telescope magazine and use of club observatory in Villa Rica.

Submissions: Article submissions are welcome, and may be delivered to the editor for consideration. Articles on computer floppy disk are encouraged.

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GRAZING OCCULTATION EVENTS FOR 1989

by Mike Kazmierczak

As you know, a new year is upon us again. As usual, there are new astronomical observing possibilities involving the moon. Along with an excellent total lunar eclipse are the usual gang of lunar occultations. Lunar occultations occur when a star disappears or reappears from view with the moon as the eclipsing body. A total occultation occurs when a moon blocks a star, but a grazing occultation occurs when the star passes along the edge of the moon. Since the moon is not smooth, a star appearing to pass along the edge of the moon can disappear behind mountains and reappear at valleys. These zones of grazing occultations are 1-4 miles wide and occur at each cusp of the moon (but a moon's diameter -- 2160 miles -- apart). If one is too far from the zone, then a miss (valuable data, but unexciting) or two widely spaced total occultations can occur. Now that you know exactly(!) what a grazing occultation is, here are the upcoming events for the first half of 1989.

There are five factors which influence the ease of observation of grazes, and as such, are important in the discussion of upcoming events. Two other factors, distance to the graze and the time of mid-graze, also affect the turnout for these phenomena.

The five factors which affect ease of observation are star magnitude, cusp angle (the distance, in degrees, measured from the terminator to the mid-graze point), moon altitude, sun altitude and percent of moon sunlit. Some of these factors can only detract from the observability (sun and moon altitude and cusp angle) and percentage sunlit and star magnitude may enhance the observability. Secondly, a graze at 4 AM on a Tuesday morning 100 miles away will attract less interest than a graze on a Saturday evening at 9 PM.

DATE	MAG.	%SUNLIT	DIST.	APER.	TIME (EST)	OTHER
JAN 04 *	8.3	12	10	6	6:28 AM	A
JAN 12	7.7	32	73	6	6:30 PM	S, M
JAN 13	8.0	43	35	8	8:17 PM	
FEB 10 *	6.2	29	9	3	9:54 PM	
MAR 12 *	5.6	35	2	3	10:07 PM	
MAR 15 *	6.8	67	4	6	10:46 PM	
APR 09	7.9	12	84	6	7:38 PM	S
MAY 09 *	8.3	25	15	8	10:31 PM	**
MAY 31	8.1	16	5	8	12:38 AM	** A, M
JUN 23	6.0	81	89	8	6:32 AM	** S, M

(**) EDT, NOT EST

Other Column Explanations:

A=Moon altitude < 15 S=Sun altitude > -10

M=Multiple star

Note: Distances are calculated from my house, which is six miles south of Conyers, to the nearest point on the graze line. This is not necessarily the area at which we will observe the graze. Your minimum distance may vary....

At this time, I am planning to lead expeditions to the grazes marked with an asterisk next to the date. However, if anyone wishes to observe any other graze, and if I can't be talked into going, I'll certainly provide you with all the necessary information to set off on your own.

This is one of the few areas of astronomy where amateurs are still making the most valuable contributions. What are they, you might ask? Three positions determine what you see during a graze. They are the position of the star, moon and observer. Using a topographic map, the observer's position can be determined with sufficient accuracy. This leaves the moon and star positions, which can be uncertain. Even bright stars can have errors in position which can be determined using data obtained from grazing occultation data.

Now that I have you salivating to go on an expedition, what do you do? Get in touch with me at a meeting or call me at 760-8502. I can tell you most anything you want to know about this exciting part of astronomy.

THE CASUAL ASTRONOMER: JANUARY 1989

by Hal Crawford

I am a casual amateur astronomer. Some of the more brazen might label me a dilettante, since I have little time to spend under the heavens, gazing into its rapturous wonder. But because I'm married to an otherwise wonderful person who doesn't quite share my interest in the outdoors or in science, and because I have a career that tends to cram 100 hours into a 40 hour work week, and because I live over an hour from what I consider to be a suitable spot for contented stargazing away from Atlanta's lights, I'm afraid I'm handicapped.

But that doesn't make me ignorant. Rarely a week passes by when I don't buy a new astronomy book from Oxford books or the Astronomy Book Club, or that I don't drool over the latest goings on at the last Texas Star Party, or suppress a yearn to race outside with my trusty 12 dollar binoculars to try to catch a star cluster that I had just read about in Sky & Telescope. The interest is there. It's in my blood. It's part of my life. I am recognized for my knowledge in astronomy, just as I know that all of you are too, since you're reading the journal dedicated primarily to Atlanta astronomers.

We are a unique lot, because we take an interest in the universe around us, and we are willing to expand our knowledge of how it all fits together. But more importantly, I believe that most of you are like *me* - casual astronomers, not by desire but by fate, who share the same belief that if only we could find some way to cure the need for sleep, we could get some serious stargazing done.

This column is not for the serious night astronomer. In this sense I'm not directly referring to professional astronomers,

although I know some astronomy students who actually think they'll never end up like me -- their work will ALWAYS require them to stay up all hours of the night in their favorite "office," the neighborhood planetarium or the open sky. They are seriously and tragically deluded. Most professional astronomers rarely spend a night under the stars anymore. They're stuck behind a computer terminal or working with physicists on any number of more mundane problems about solving the riddles of the universe. Or they're stuck in a classroom teaching a bunch of bored students who don't share our dreams of the cosmos. By the time the sun goes down, they're ready for bed.

In the same (star) light, I'm referring to serious astronomers who manage to cast aside any semblance of home or office life and head out to the open meadow three, four, even five times a week. This article is not for them. Instead, I want to talk about the rest of us. The ones who can only dream about going out three, four, five times a week! Perhaps we can go someplace special once, maybe even twice a month. Few of us own a telescope, since we have so little time to use it, anyway! These serious folks will probably find what I have to say mundane anyway.

No, this column is, as they say, for "the rest of us." The silent majority, who make up the most important part of the club membership. We care about astronomy!

Having made that point, I'll describe what this is all about. Each column is in two parts - the first being a tirade on some aspect of locally relevant astronomy (sort of what you're reading now), the second being a brief, informative piece on the sky for the current month (sort of what you'll see below). This is primarily for the benefit of new members who want to know if there REALLY is anything interesting up there, but if you read closely, you'll find information that most amateurs, and just maybe some professional astronomers don't know. It is my goal to show you that the tiny points of light glowing dimly above us are actually shining examples of the most wondrous aspects of the universe.

To introduce this admittedly great concept (okay, I'll admit it, "This is a great concept!"), I'm going to start with a recognizable constellation and star in the sky, and work from there. This is to get club newcomers familiar with the sky right away.

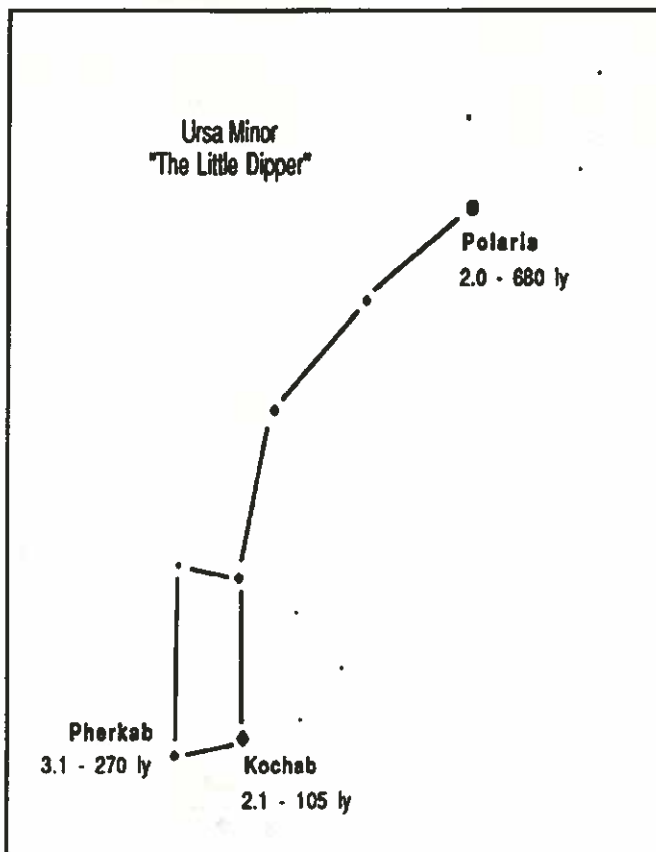
Polaris and Ursa Minor -- "The Little Dipper"

Polaris (poe-LAH-ris, Latin name is Alpha Ursae Minoris) is the most famous star in the sky. Although it isn't the brightest star visible in the heavens, it can be found at all times throughout the year. It was used by early celestial navigators for hundreds of years and is still relied upon by astronomers who use the star to set up telescopes. Located from the Atlanta area, Polaris appears 33 degrees 46 minutes above the horizon due North, which coincidentally is the exact latitude position of Atlanta, Georgia. (Ahem....okay, maybe it's not that much a coincidence...) It is a white F7 supergiant star, with a magnitude of 2.0. This makes it a rather dim star in the metropolitan area, but on most clear nights it should be readily visible.

The fact that Polaris is Latin for "the Pole Star" really is a matter of coincidence. Due to the forces of precessional move-

ment, the polar axis of the Earth moves throughout a 47 degree circle during a period of 26,000 years. Right now the Earth Pole's arc is approaching Polaris -- it will reach minimum distance to the star in the year 2012. 14,000 years from now, the pole star will be Vega, in the constellation Cygnus.

It may surprise even the most experienced of you to learn that the North Star is a variable star -- a true Cepheid, its magnitude actually varies between 1.92 and 2.02 in a period of approximately four days. Even though it is the alpha star in the constellation, it dims to less brightness than UMi Beta! Its distance is 350 light years. In the year 1779, Sir William Herschel discovered that Polaris is a double star. Visible in telescopes at least three inches in size, the companion is ninth-magnitude in



brightness. Spectral analysis of the star indicates that there is another, invisible companion star, which orbits the primary. However, this is not visually apparent.

I might have been remiss in suggesting that The Little Dipper be the first constellation to discuss - although it is above the horizon all year around, the constellation contains only three stars brighter than fourth-magnitude, and clear, dark skies are required to distinguish it. However, since we're supposed to be like real astronomers, and it's going to be one of the first questions a neophyte is going to ask, well, you better be ready. Probably the best way to find Ursa Minor (Latin: Ursae Minoris) is to find the "Big Dipper" (which is composed of brighter stars), and use the two stars at the bowl end of the dipper, Merak and

Dubhe to point to the North star. From there, well, just look long enough, and it should be obvious.

Polaris marks the end of the Little Dipper's handle, while at the opposite end, the stars Kochab and Pherkad are located at the front of the Dipper's bowl. Kochab (KOE-cab) is the brighter star, at 2.06 magnitude. Far less luminous than Polaris, its relative brightness is mostly attributable to being one sixth as far as Polaris from our system, 110 light years away. It was once considered as the Pole Star from 1500 B.C. to 500 A.D., when the role was gradually assumed by Polaris.

Pherkad's name is derived from the Arabic Ahfa al Farkadain ("Dim One of the Two Calves"), obviously referring to Kochab as the brighter 'calf'. It is a wide double star, and can be resolved even with the naked eye. Kochab and Pherkad were designated by ancient poets as symbols of constancy, and like Polaris were used to faithfully guide night travellers. Together, they were also used to tell time down through the ages by country dwellers as well as navigators.

Ursa Minor, or "Little Bear" is believed to have been introduced into Greece about 600 B.C. from the Middle East. In Greek Mythology, the Little Bear represented Arcas, the son of Princess Callisto of Arcadia, who was transformed into the Great Bear (Ursa Major) when placed into the sky by Zeus. Other interesting names have been applied to the constellation. The ancient Arabians called it the Lesser Bear, the Fish, and the Bearing of the Earth's Axis, among other names. To the Egyptians, the stars represent a Jackal. Vikings recognized the stars as a small chariot, or the Throne of Thor. Today Scandinavians refer to Ursa Minor as the Little Wagon.

My charts don't show any other significant deep-sky objects in the vicinity of Ursa Minor.

GRAZING OCCULTATION REPORT

by Mike Kazmierczak

It was a hazy afternoon as I drove home from work and saw lots of cirrus clouds obscuring the moon. The graze battalion (Will Rogers and Steve Gilbreath) arrived at my house at 5:45 PM, and we talked about the weather. Cirrus haze was still there, but I was optimistic. We drove out at 6:15 in search of the graze site (Spring Hill Church). Karen, my lovely wife, and I had checked out possible sites earlier that weekend, so I anticipated no difficulty in relocating them. Will, Steve and I stopped once after I missed a turn and drove around for a while. I knew I was close, but I was not in the right frame of mind. Not to mention, time was ticking away. After a quick map check phone call to Karen, we proceeded on our way to the graze site. When we arrived, I was greeted with, "Well, where are we now?" by my doubtful comrades. "At the graze site, of course", I replied with confidence. I decided to set up the entire expedition at this site since we had little time for a move to another site, and since this was Steve's first graze. Both telescopes (a 10 inch and 8 inch Meade) were set up with little trouble. All time signals and tape recorders were working fine when I saw a faint star near the moon. Steve couldn't see it, and he was discouraged. After

looking through Steve's scope, I couldn't see it either. When I returned to my scope, it was not to be seen. However, Steve looked at the other cusp, and there was a much brighter star there. That was it! About 15 minutes before the graze, a van pulled into the church parking lot. I thought it was the cops, whom one encounters on occasion while observing in the dark, but it turned out to be a UPS van delivering a book. The driver said hopefully, "Do y'all work here?". We said no, and he just left the book on the church steps. Of course, he asked what we were doing, and after I explained, Steve showed him a view of the moon. He was impressed and sped off much happier for his little trip. After a brief pep talk and some words of instruction, we awaited the graze. Since this was a double star, I told Steve to expect increases and decreases in magnitude, rather than on/off events of the star. There were a large number of cars on the road, and we even saw several planes (with jetwake) pass near and in front of the moon. The graze began and all the events were recorded without difficulty. Will told Steve when it was over, "Wow, I forgot to press the record button (on the tape recorder)..." But he was joking. We replayed the tapes on the way back to my house and enjoyed them immensely. Steve is now hooked on grazes, as I have been ever since I saw my first one.

CLASSIFIED ADS

For Sale: Parks 12.5 inch Dobsonian Reflector. Two inch 32mm Erfle eyepiece; \$1000.00.
Contact Chet Lapeza at 962-6770.

The Atlanta Astronomy Club would like to express its deepest sympathy to the friends and family of former club member Chuck Allen, who passed away on December 21 after a long illness. Chuck was very involved with the Atlanta astronomical community, including Fernbank Science Center, and the U.S. space program. Chuck had lived in Dalton with his wife Vicky for the past three years.

A trust fund has been set up in Chuck's name for the Challenger II fund. Anyone interested in donating to this cause in Chuck's name should contact Mark Lancaster at 279-9137.

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