UPCOMING EVENTS

6-11 Monday: American Astronomical Society meeting begins in Albuquerque
6-12 Tuesday: Monthly meeting of the Society at 7:30 p.m. preceding Public Lecture by Dr. Ed Stone, JPL, on Voyager Encounter Neptune, 8 p.m., Albuquerque Convention Center
6-14 Thursday: Society Board of Directors Meeting, 7:00 p.m.
6-16 Saturday: Star Party at Twining Observatory site
6-21 Thursday: Summer Solstice, 9:33 a.m. MDT
6-22 Friday: New Moon
6-23 Saturday: Dark Sky Night at Gran Quivira
6-28 Thursday: Uranus at opposition
7-4 Wednesday: Neptune at opposition
7-7 Saturday: Full Moon

THIS MONTH'S MEETING

This month, we're holding our general meeting in conjunction with the semi-annual meeting of the American Astronomical Society in Albuquerque. At the invitation of Dr. Hargit Ahluwalia, chairman of the local organizing committee for the American Astronomical Society meeting, we will join the national organization of professional astronomers to hear Dr. Ed Stone of the Jet Propulsion Laboratory in Pasadena, CA, talk on Voyager Encounter Neptune. We'll meet in the lobby of the Albuquerque Convention Center at 7:30 p.m. for our usual pre-program announcements, then hear Dr. Stone's lecture at 8:00 p.m. This is an exciting opportunity to hear a lecturer many of us have seen interviewed on television during the Voyager spacecraft's visits to faraway planets. In addition, we're honored to hold our meeting in conjunction with the meeting of the prestigious professional astronomical organization.

THE MAY MEETING

In May, we held a "town meeting" of the Society. This gave everyone a chance to hear about the ongoing programs of our organization, and to voice their thoughts and opinions. Many topics were discussed, including speakers, meeting times and days, and many others. Two of the most important programs of the Society got particular attention as Art Jacobs outlined the highly-successful public-education efforts we've been mounting over the last couple of years, and Vice President George Dulley illustrated a report on the progress on constructing the General Nathan Twining Observatory with slides of the construction activities. The Board of Directors thanks everyone who came to this meeting to listen and discuss the future of our Society.

THE TELESCOPE RAFFLE

The other "big event" of the May meeting was the telescope drawing. Kurt's Camera Corral kindly donated a 60mm Bushnell refractor to our Society for a raffle to raise funds for the Observatory Fund. We sold raffle tickets at the Kid's Fest celebration in Tiguex Park and also at the State Fairgrounds Flea Market. The last chance to buy tickets was at the May meeting, and many members bought tickets then. When the drawing came at the end of the meeting, the lucky winners were Claire and Jimmy Long, children of Mr. & Mrs. Dave Long of Albuquerque. They happily received their telescope the day after the drawing. Our thanks go to Kurt's Camera Corral for this donation, which raised more than $250 for the observatory.
SUMMARY OF THE MAY 31ST 1990 BOARD MEETING

President Dave Finley called the meeting to order at 7:11 p.m. and made initial announcements about soliciting more funds for our observatory construction project. Treasurer Leo Wellner reported that the Society has balances of $1178.68 in the Observatory Fund and $1454.68 in the General Fund. Secretary Bruce Levin reported that the Society has a membership of 261 members. Events Coordinator Art Jacobs talked about upcoming events and the need for more volunteers to help with these and future events. Dave Finley provided information about our upcoming meeting with the American Astronomical Society. Astronomy Day Coordinator Bill Airo told about the displays and presentations that are being organized for Astronomy Day.

The Society Observatory was the next item on the agenda. Vice President George Dulleck commented about the present and future construction status of the General Nathan Twining Observatory. Bruce Levin moved that the Observatory Committee prepare future plans for observatory additions for presentation to the board at the next board meeting for fund solicitation purposes. The motion was seconded by Mac Morgan and unanimously passed by the board.

Final items of discussion were membership costs for members residing in foreign countries, and newsletter articles. The meeting was adjourned at 9:17 p.m.

ASTRONOMY DOCENT PROGRAM

Involvement in the Albuquerque Astronomical Society’s public education programs can be one of the most enjoyable and rewarding aspects of membership in the AAS. Several members have expressed an interest in participating in a public education event, but have not done so due to a lack of confidence in their ability to teach the subject to someone else. As a consequence, it was resolved at the May meeting of the Board of Directors that the AAS would initiate an astronomy docent program.

The purpose of the docent program will be to instill in participants the skill and self-confidence necessary to share their enjoyment of astronomy with members of the public. Instruction will be provided free of charge by one or more AAS members knowledgeable about public education in astronomy. A preliminary list of topics to be covered includes the scale of the solar system, the scale of the universe, constellations, and telescopes. A general announcement regarding the docent program will be made at the next general meeting. Further details can be obtained by calling me at 344-4985.

Art Jacobs, Event Coordinator

AAS PUBLIC EDUCATION CALENDAR

<table>
<thead>
<tr>
<th>EVENT</th>
<th>TYPE</th>
<th>LOCATION</th>
<th>AGE/GRADE</th>
<th>DATE</th>
<th>DAY</th>
<th>TIME</th>
<th>VOLUNTEERS</th>
<th>NEEDED SHORT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starfire Camp</td>
<td>PR,SP</td>
<td>Tijeras Canyon</td>
<td>Adult</td>
<td>6-6-90</td>
<td>We</td>
<td>8:30P-9:45P</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Bandelier</td>
<td>PR,SP</td>
<td>Bandelier Nat. Mon. All</td>
<td>6-16-90</td>
<td>Sa</td>
<td>8:30P-10:00P</td>
<td>8</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Astronomy Day</td>
<td>PR,SP,DI</td>
<td>Nat Hist Museum All</td>
<td>6-30-90</td>
<td>Sa</td>
<td>9:00A-10:00P</td>
<td>Many</td>
<td>Many</td>
<td></td>
</tr>
<tr>
<td>Sandia Mt. Disc. Day</td>
<td>DI</td>
<td>Sandia Ski Area All</td>
<td>7-28-90</td>
<td>Sa</td>
<td>9:30A-11:30P</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Bandelier</td>
<td>PR,SP</td>
<td>Bandelier Nat. Mon. All</td>
<td>7-28-90</td>
<td>Sa</td>
<td>8:30P-10:00P</td>
<td>8</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Bandelier</td>
<td>PR,SP</td>
<td>Bandelier Nat. Mon. All</td>
<td>8-25-90</td>
<td>Sa</td>
<td>8:30P-10:00P</td>
<td>8</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

*SP = Star Party  
PR = Presentation  
DI = Display

Call Art Jacobs (344-4985) for more information.

HELP WANTED!

Astronomy Day is scheduled for June 30, 1990. Events will be held at the New Mexico Museum of Natural History. We need people, telescopes, solar scopes, computers, astronomical software, video equipment, astronomical videos, exhibits, demonstrations, astrophotographs, and ideas. Please contact me if you can assist in any way. Bill Airo, 292-2745.

ASTRONOMICAL CLASSIFIEDS

For Sale: 9mm premium orthoscopic eyepiece, $35; 2.4X Televue barlow lens, $45. Call Art at 344-4985.
OCCULTATION UPDATE

Note: The format for this update has been changed. The key to this new format and a discussion of what this is all about was provided in a double-sided page for your Membership Packet with the March issue—to avoid excessive repetition in this newsletter.

1. Selected Total Lunar Occultations. (There are others at less convenient times. Call me if you wish.)

Day/Date Time P USNO O MAX PCT SN MN MN CA A B C
H M S REF NO V MAG SNLT AL AL AZ

a. Your Own Observation Site
June - Mountain Daylight Time

THU/06 01 36 06 D 2174 85 6.4 96+ 15 225 48S -1.8 -2.3 -0.1
THU/06 21 18 14 D 2287 99 3.0 98+ 24 154 34S -1.2 -0.6 -1.4
THU/06 22 40 51 R 2287 97 3.0 98+ 29 174-87N -2.7 0.4 0.1
SAT/09 03 28 24 R 2575 94 6.8 99- 17 217 05N -2.3 -1.9 0.2
SUN/10 22 58 18 R 2857 95 6.7 93- 14 133 73N -1.2 0.9 -1.1
THU/14 00 39 19 R 3238 76 7.0 70- 17 116 76S -0.9 1.9 -0.3
THU/14 00 54 14 R X30377 95 7.5 69- 20 118 28N -1.6 -0.8 -3.3

b. Gen. Twining Observatory Site!!! June - MDT

WED/06 01 36 46 D 2174 85 6.4 96+ 16 225 47S
WED/06 21 18 08 D 2287 99 3.0 98+ 24 154 32S
WED/06 22 39 38 R 2287 98 3.0 98+ 29 174-88N
SUN/10 22 57 22 R 2857 95 6.7 93- 14 132 75N
THU/14 00 37 58 R 3238 76 7.0 70- 16 116 76S
THU/14 00 54 04 R X30377 95 7.5 69- 20 118 30N
SUN/17 02 28 59 R X00750 76 8.6 37- 22 96 38S
SUN/17 03 17 30 R X00782 86 8.2 36- 32 103 47N
SUN/17 03 11 06 R X00810 86 8.7 36- 31 102 20S
SUN/17 03 13 36 R X00817 86 8.7 36- 31 102 13S

c. Gran Quivira [Your Occultation Coordinator assumes that all GQ fun is to be pre-empted by Twining Site labors.]
d. Selected Lunar Occultations of the Pleiades June - MDT

aa. Your own backyard.

WED/20 08 19 42 D P00043 91 5.4 7- 40 67 111-58S -2.6 -0.8 -0.7
WED/20 08 29 00 D P00067 83 4.2 7- 42 68 113-89N -1.9 0.8 -0.4
WED/20 08 54 01 D P00110 94 3.8 7- 47 73 124-57S -2.2 -1.2 -0.6
WED/20 09 13 13 R P00043 91 5.4 7- 51 76 137 29S -1.0 3.5 0.2
WED/20 09 45 18 R P00067 83 4.2 7- 57 79 167 63S -1.8 1.4 0.1
WED/20 09 48 28 R P00110 94 3.8 7- 58 79 170 30S -1.3 3.4 0.3

bb. Gen. Twining Observatory Site
None on our work weekends.
c. Gran Quivira [Assumed preempted for work at the Twining site.]

2. Selected Grazing Occultations

Day/Date MDTNearest Town SAO # Mag Alt Az PSn1 Cusp Rating Leader
WED0620 0400 TWINING LN 75990 7.6 16 72 8- 13.1N FAVORABLE MORGAN

3. Occultations By Asteroids
(We have more information on these. If you are interested in trying any of these, call me.)

FRI0615 at 20 hrs 31.2 minutes HEDWIG occults 9.3 mag. star No. +01 1269 SAO 118148

Mac Morgan 296-3983
EL CIELO ESTRELLADO

The Herdsman Overhead

As summer approaches, Bootes occupies a prominent position in the evening sky—nearly overhead for observers at 35° N latitude. To the modern eye, the bright stars in this constellation form a pattern that resembles either a child's kite (complete with streamers) or another warm weather favorite, the ice cream cone. In a more agrarian time and place, people were inclined to see this constellation representing a Ploughman (with the “Big Dipper” as his plough) or a Herdsman. The name Bootes has sometimes been interpreted to mean “ox-driver” and, with a little imagination, the nearby constellation of Ursa Major can be visualized as a cart pulled by oxen. But, the more common association of Ursa Major and Ursa Minor with two bears suggests a different picture in which Bootes is seen as a Bear Driver. With the help of his hunting dogs (Canes Venatici), Bootes appears to chase the celestial bruins around and around the pole. This picture is consistent with the popular name for Alpha Bootis; i.e., Arcturus, which means “Guardian of the Bear.” Bootes is a fairly large constellation that spans over 45° of declination. In addition to an unusual number of bright and beautiful multiple stars, this region of sky contains a decent selection of deep sky objects for medium to large backyard telescopes.

At visual magnitude -0.04, Arcturus is the brightest star in the northern celestial hemisphere (edging out Vega and Capella at mag. +0.03 and +0.08, respectively). This distinguished ranking arises from two factors. First, Arcturus is an orange giant (spectral type K2 III, absolute magnitude -0.2) about 25 times larger than the Sun. Second, this ruddy beacon is a relatively close object located at distance of 36 light years. Only about 500 stars lie nearer to the Earth. The story of Arcturus is rich in lore as well as in matters of scientific interest. For example, Arcturus is said to be the first star seen with a telescope in broad daylight, a feat performed by Morin in 1635. In this century, Arcturus gained notoriety as the power source that was used to open the 1933 Chicago World Fair. To carry out this task, light from the star was collected by the 40-inch Yerkes telescope and focused onto photovoltaic cells, generating a small electric current that was employed (after amplification) to turn on the lights at the fair (see Sky and Telescope for June, 1988, p. 674). Arcturus is also known for its relatively fast proper motion, 2.29° per year. This “rapid” movement against the sky arises from its unusual trajectory compared to the Sun. Like many other stars in our neighborhood, the Sun is moving around the center of the Milky Way at a speed of ~250 km/s. Arcturus, on the other hand, is not part of the “galactic stream.” Rather, it is presently approaching us in an orbit that is highly inclined to the plane of the galaxy. As a result, watching Arcturus is akin to watching oncoming traffic go by while driving down the highway—on a much different time and distance scale, of course!

The treasure trove of multiple stars in Bootes includes a couple of nice objects for binoculars. Nu (ν) Bootis is a very wide double consisting of a mag. 5.0 white star and a more distant but equally bright orange giant. Mu (μ) Bootis also appears as a double in binoculars; however, a medium to large telescope will reveal that the secondary is itself a double object comprised of mag. 7.0 and mag. 7.6 stars. The showpiece multiple star in the constellation is Epsilon (ε) Bootis. This splendid double consists of a mag. 2.5 orange (spectral type K0) primary and a mag. 4.9 blue-white (spectral type A0) companion separated by 2.8" in position angle 340°. The color contrast in this pair is similar to that exhibited by Albireo or Gamma Andromedae but the modest angular separation presents more of a challenge for small aperture scopes. When resolved, Epsilon Boo reveals the source of inspiration for its poetic alternate name, Pulcherrima (the “Most Beautiful One”). Another intriguing double is 44 Boo, the coordinates: RA. 15 hr. 03.8', Dec. +47° 39’. The apparent orbit in this system is very elongated ellipse. In 1969, the two stars were separated by only 0.4" but the “gap” is now near 1.5" and slowly widening. If you observe 44 Boo at different times in a given night, you may notice a significant change in appearance—the secondary star is an eclipsing binary with a period of only 6 1/2 hours. The primary component is a mag. 5.3 star while the secondary varies from mag. 6.5 to mag. 7.1. Other objects to include in a night of double star observing are Kappa (κ), Pi (π), XI (ξ) and Iota (ι) Bootis as well as 39 Boo (14 hr. 49.7", 48° 43') and Struve 1871 (14 hr. 41.8", 51° 24’).

Deep sky objects for a dark night include the loose and poorly concentrated (Shapley-Sawyer Class XII) globular cluster NGC 5466 (14 hr. 05.5', 28° 32') and moderately bright galaxies such as NGC 5548 (14 hr. 18.0', 25° 08'), NGC 5557 (14 hr. 18.4', 36° 30'), NGC 5600 (14 hr. 23.8', 14° 38'), NGC 5660 (14 hr. 29.8', 49° 37'), NGC 5676 (14 hr. 32.8', 49° 26'), NGC 5689 (14 hr. 35.5', 48° 45') and NGC 5680 (14 hr. 58.7', 53° 53'). NGC 5660, NGC 5676 and NGC 5689 are the most luminous members of a small group in the Canes Venatici-Camelopardalis cloud. According to R. Brent Tully's Nearby Galaxies Catalog, these systems reside at a distance of 34-37 megaparsecs. NGC 5548, on the other hand, is a Seyfert galaxy (look for the nearly stellar nucleus) that lies about twice as far away.

Wayne M. Trott

### July 1990 Lunar Almanac

<table>
<thead>
<tr>
<th>Sunday</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Albuquerque, NM  
Time Zone: MDT  
Latitude: 35.08  
Longitude: 106.65

- MR = Moonrise, upper limb on horizon.  
- TR = Transit, moon is due south and also highest in the sky.  
- MS = Moonset, upper limb on horizon.  
- Times are rounded to nearest minute.  
- RA = Azimuth of rising moon.  
- TA = Azimuth of transit.  
- SA = Azimuth of setting moon.  
- Attitudes and azimuthe are in degrees.  
- Moon phase is shown each day at 12:00  
- moon in the time zone indicated.

Calendar by Roy Sterner  
Johns Hopkins Applied Physics Lab.  
Laurel, MD 20707

### July 1990 Solar Almanac

<table>
<thead>
<tr>
<th>Sunday</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Albuquerque, NM  
Time Zone: MDT  
Latitude: 35.08  
Longitude: 106.65

- MA = Morning astronomical twilight.  
- NM = Morning nautical twilight.  
- MC = Morning civil twilight.  
- SR = Sunrise, upper limb on horizon.  
- TR = Transit, sun is due south and also highest in the sky.  
- SS = Sunset, upper limb on horizon.  
- EC = Evening civil twilight.  
- EN = Evening nautical twilight.  
- EA = Evening astronomical twilight.  
- Times are rounded to nearest minute.

- RA = Azimuth of rising sun.  
- TA = Azimuth of transit.  
- SA = Azimuth of setting sun.  
- Attitudes and azimuths are in degrees.

Calendar by Roy Sterner  
Johns Hopkins Applied Physics Lab.  
Laurel, MD 20707

July 1990
DUES: Please note the expiration date on your mailing label. If you are due for membership renewal, you may send your dues by mail to our newsletter return address with your check written out to The Albuquerque Astronomical Society or give your check to the Treasurer at the next meeting. Please include the membership application that is sent with your newsletter when it is time to renew. Discount subscriptions to Sky and Telescope, Astronomy, Odyssey, Deep Sky, Telescope Making and The Observer's Guide magazines, and books through Sky Publishing Corporation are available at a reduced cost when purchased by The Albuquerque Astronomical Society members through our Society. Include any of the above magazine renewal mailers and subscription payment as part of your renewal check. Membership dues are $13.00 per year and $3.00 per additional family member. Membership Packets cost $1.75 each for new members or renewing members without the Packet. Contact the Treasurer for more information.

SOCIETY COMPUTER BULLETIN BOARD SERVICE: An Astronomy BBS is available for The Albuquerque Astronomical Society members for discussion, announcements, and transfer of files and newsletter articles in our software library. The BBS is available 24 hours a day at 255-3623. Set your computer's modem to 8 N 1 (8 data bits, no parity, and 1 stop bit). Contact the Software Coordinator for more information.

NEWSLETTER ARTICLES: Personal astronomical classified advertisements and articles can be submitted within 5 days after the latest Society meeting in order to make it into the next newsletter. Business card size advertisements for businesses related to astronomy are accepted with the same deadline as articles and personal classified advertisements. Rates for business card size ads are $10/ad per issue of the Sidereal Times, $7/ad per issue for six continuous issues, and $5/ad per issue for twelve continuous issues. The Newsletter Editor reserves the right to include and/or edit any article or personal classified or business card size advertisement. Computer files in ASCII format (WordStar non-document mode) are preferred. Contact the Newsletter Editor for more information.

CHANGE OF ADDRESS: Note that the Sidereal Times is mailed out at non-profit bulk rate. The newsletter will not be forwarded to your new address if you move! Please provide the Secretary with your new mailing address to insure that you receive your newsletter.

Albuquerque Astronomical Society
P.O. Box 54072
Albuquerque, NM 87153
Address Correction Requested

- Society Staff -

President: Dave Finley 291-0402 (home)
Vice President: George Dulleck 293-7994 (home)
Treasurer: Leo Wellner 292-0948 (home)
Secretary: Bruce Levin 299-0891 (home)
Newsletter Editor: Steve Williams 888-4885 (home)
Assoc Sec/Software Coord/ABM: Michael Fisk 268-4885 (home)
Events Coordinator: Art Jacobs 344-4985 (home)
Librarian: Lee Mesibov 292-1249 (home)
Occultation Coordinator: Mac Morgan 296-3983 (home)
Telescope Curator/ABM: Alan Trever 275-2601 (home)
Board Member: Chris Hilleary 298-0093 (home)
Membership Coordinator: George Pellegrino 621-8516 (home)
Astronomy Day Coordinator: Bill Airo 292-2745 (home)
Associate Board Member—ABM: Paul Maestas 883-1086 (home)