July-August 1983
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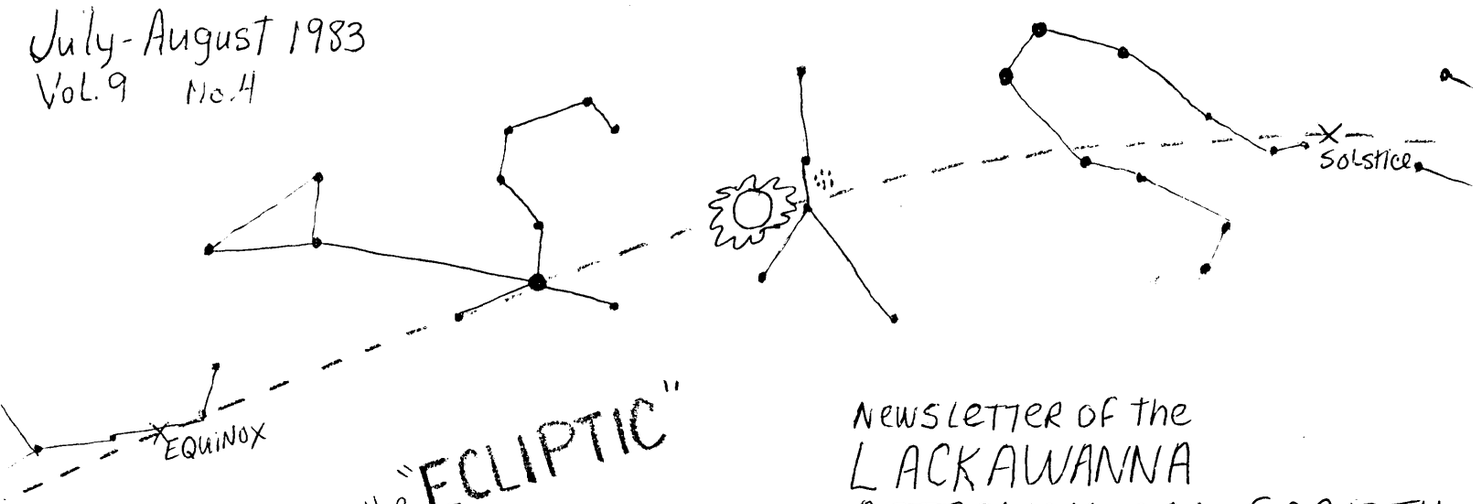

the "ECLIPTIC"

Newsletter of the
LACKAWANNA
ASTRONOMICAL SOCIETY
SCRANTON, PENNSYLVANIA

LAS OFFICERS AND BOARD MEMBERS FOR 1983

President - Jo-Ann Pluciennik
Vice President - John Sabia
Secretary - Bob Maleninsky
Treasurer - Joe Kamichitis
Junior Vice President - Scott Bailey
At-Large Members - Jill Adelstein/Bob Bolock/Bill Mecca

LAS CALENDAR

DATE	ACTIVITY	PLACE	TIME
July 5 Tuesday	Regular meeting	Everhart Museum	7:30 PM
July 7 Thursday	Slide program/public star party	Promised Land State Park	9:00 PM
*July 9 Saturday	rain date for Promised land program or outing/ club night	Promised Land State Park or KJC/LASO	9:00 PM or 6:00 PM and on
July 11 Monday	"X-ray Astronomy" by Tom Cupillari (repeated 7/13) observing follows	KJCO, Fleetville, PA	8:00 PM
Jul 15,16,17 Fri-Sun	Mideast Region of Astronomical League convention	Messiah College, Grantham, PA	(See officers for flyers)
*July 16 Saturday	outing/club night only if 7/9 used for Promised Land Program	KJC/LASO Fleetville, PA	6:00 PM and on
July 18 Monday repeated 7/20	"The Spectrum-How We Know About the Stars" Jo-Ann Pluciennik observing follows	KJCO, Fleetville, PA	8:00 PM
July 19 Tuesday	Board Meeting	home of J. Pluciennik	8:00 PM
July 25 Monday repeated 7/27	"Photographing the Night Sky" John D.Sabia observing follows	KJCO, Fleetville, PA	8:00 PM
August 2 Tuesday	Regular Meeting	Everhart Museum	7:30 PM
Aug 5,6,7 Fri-Sun	Stellafane ATM Convention	Springfield, Vermont	

LAS CALENDAR
Continued

DATE	ACTIVITY	PLACE	TIME
August 12 Friday	Perseid meteor shower maximum	Earth (observe a few days before and after this date)	8:00 PM
August 13 Saturday	outing/club night	KJC/LASO Fleetville, PA	6:00 PM and on
August 16 Tuesday	Board Meeting	home of J. Pluciennik	8:00 PM
August 18 Thursday	slide program/ public star party	Promised Land State Park	8:30 PM
August 20 Saturday	rain date for Promised Land program	Promised Land State Park	8:30 PM
September 6 Tuesday	Regular Meeting	Everhart Museum	7:30 PM
September 10 Saturday	club observing night	KJC/LASO Fleetville, PA	8:00 PM
September 20 Tuesday	Board Meeting	home of J. Pluciennik	8:00 PM

*Contact Jo-Ann Pluciennik if you're unsure of what is scheduled (346-3268.)

KJC/LASO is on Route 107, about halfway from Exit 61 of I 81, as you head to Fleetville Corners. You take a left on Hack Road. The gate is right there.

SUMMER ACTIVITIES
(Meetings)

The LAS's program plans for the summer meetings are a bit nebulous. While this is somewhat appropriate for a season noted for atmospheric haze and the prominent "clouds" of the Milky Way, it's not as bad as it sounds. The meeting dates are fixed and we know what programs will be given. It's the matching up of the program with the date that is tentative.

In the works (besides the usual constellation talks and upcoming events) we have "The Schmidt Camera", "Diffuse Nebulae", "Observing Meteors", "Choosing and Using Star Atlases", and even, possibly a couple of NASA films. At any rate, we promise that each meeting's programs will be varied, informative, and to the point. Don't take a chance on missing the topics that intrigue you; make it a point to attend all the meetings.

(Outings/club nights)

The June club night/outing was off in only one respect -- in June people have too many committments to graduation parties, etc. which cut down on attendence. Except for that, the outing was a rare combination of ideal conditions. A hot, clear, low humidity day turned into a fine dark night with rock-steady images. In the daytime you could observe the cows, the sunspots and the deer that came out of the woods and hung around the field for a good ten minutes.

Later on the images of the planets were spectacular, especially Saturn with two divisions visible in its rings and the crepe ring blatently obvious in the 9" and Scott's 8". (I was sure we could have seen those "Voyager spokes" too, but my eye is probably not well trained enough.) While we returned regularly to peruse the images of Saturn and Jupiter, you also had the Cygnus-Scutum-Sagittarius Milky Way begging to be explored. The classic clusters and nebulae looked so good, you were easily distracted from doing any in-depth searches for obscure objects. While some argued that it was too good a planetary night to spend time on deep-sky, the rest of us did spend time tracking down the brighter sections of the veil, etc.

If, at the next two outings, we don't get our traditional clouds and rain,

make your plans to join us. Our scheduled nights are all around new moon or before first quarter; even with haze, you'll still have the planets. Get to see the sky you've been missing in town, and in summer comfort, too.

J. M. Pluciennik
President

PROMISED LAND PROGRAMS EXPAND

Due to the popularity of the club's astronomy programs at Promised Land State Park, we have been asked by officials there to give more than just the one we have been doing the past two summers. We've come up with three dates for programs at the park which, oddly enough, don't seem to interfere with our otherwise busy summer-time activities. In tabular form (suitable for everyone with home computers), these programs are scheduled as follows:

PROGRAM DATE	RAIN DATE	TIME START
June 23	June 25	9:00 PM
July 7	July 9	9:00 PM
August 18	August 20	8:30 PM

The June 23rd program has, of course, already been held and the results of it show not only the great response that our programs at Promised Land receive, but what a good astronomy presentation can be. We had good weather, good public attendence, and good member participation. About 175 people listened attentively as Jo-Ann took them through her skillfully narrated slide program. Later, they viewed the moon, Venus, Jupiter, Saturn, double stars, and a few of the brighter deep-sky objects through seven telescopes manned (or womanned) by ten club members. The delighted response of a person seeing Saturn or Jupiter with their own eyes through a decent telescope makes these presentations worthwhile, and people from other clubs reading this might want to check with officials at state parks in their area and perhaps give a few star parties there.

Directions for Promised Land State Park are: take scenic route 84E to exit 7 (Promised Land), go south (right) a pleasant 4.6 miles on 390, turn left at the Park Office for a rustic 1.0 miles to the Pickerel Point Contact Station. The Nature Museum where the programs are held is just on your right and telescopes are set up in the field a few feet further on.

As our President reminded us at the June Meeting, the LAS Constitution says that one reason the club exists is "to encourage the growth of interest in Astronomy." ... and our programs at Promised Land are where we can rally to the cause.

Joe Kamichitis

THE SPACE TELESCOPE

NOTE: The following is from a lecture given by Dr. Nancy Roman at the Citadel on Thursday, February 17, 1983. Dr. Roman has held many important positions with NASA, including Program Scientist for the Space Telescope. She is currently a Harlow Shapley Lecturer for the American Astronomical Society.

We are all aware of the problems the Earth's atmosphere causes in astronomical work. Stars "twinkle," the moon washes out the sky and only a narrow band of the electromagnetic spectrum can pass through. Some of these problems can now be corrected by computer image enhancement techniques, however, the only real solution is to place your instrument above the atmosphere. In late 1984, NASA will attempt just such a solution by launching the Space Telescope into a 400-500 KM orbit. Since the telescope is to be launched by the Space Shuttle, its size is limited to a 94" primary mirror. Even then the telescope platform will just barely fit inside the Shuttle's bay. The Space Telescope will be able to see objects seven times fainter than is now possible with ground based observations. It will also offer a far greater resolving power by having the objects placed against the darkness of space, rather than against the relatively light night sky.

The telescope is a slightly modified Cassegrain design. It contains a sun sheild as well as concentric rings or baffles inside the tube to minimize stray light. The maximum background light on which an object will have to be viewed will then be only the zodiacal light. This great improvement in contrast will improve the resolving power of the instrument. A Jupiter-size planet in the Alpha Centari System could be seen by the Space Telescope. The entire telescope platform can be positioned within an accuracy of 7/1000 of a second of arc, while its orbit and orientation can be changed at will.

The mirror is not of a conventional design for it would then be far too heavy to launch. Rather it is made of an "egg crate" plastic frame which is coated with a layer of silica. The flat mirror is then heated in an oven and molded into an approximate shape. Final shaping is done by polishing. The mirror will be accurate to within 1/70 of a wavelength of red light, or to 10 Å, making it the most accurate mirror ever constructed. As mentioned before, its size is limited to 94" diameter. The primary mirror, as well as the graphite-epoxy framework holding the secondary mirror, are designed for minimal thermal expansions at the temperature the telescope will be operated.

The telescope will orbit the earth at an altitude of 400-500 km. It has an expected life span of 20 years. Also it can be refurbished, repaired, or returned by the Space Shuttle. The expected image quality is 1/100" of arc, while the best quality currently available is 1" of arc. NASA (Goddard) will receive the initial telemetry, while a Space Telescope scientific center is being set up in Baltimore, MD. The Telescope will then be treated as are the national observatories, open to any professional astronomer at no cost. (I'm not sure if a valid LAS card will get you in, but you could always give it a try!)

There are four main instruments which all lie in the focal plane of the telescope. First a photometer, with a time resolution of 16 micro-seconds used to study occultations of planets, asteroids, ring systems, etc... by stars. There are two cameras on board. The first so called "wide angle" camera (field is 2.7' arc) which operates not with film, but with CCD's (Charge Coupled Devices) now used widely in bank security cameras. The second is a faint object camera with a resolution better than that of the telescope at 22/1000" of arc. This camera was built by the Europeans so they have been granted a flat 15% of the viewing time. It operates with an image intensifier coupled to a conventional television camera. Both cameras include various filters, as well as a chromographic mask to filter the bright centers of comets and galaxies. There are also two spectrographs on board. The first, a faint object spectrograph, is used mainly in the ultraviolet. It is capable of seeing objects down to the 27th magnitude, and it uses digicon solid state cameras. There is also a high resolution spectrograph with a digicon camera. The final capability of the Space Telescope is not an instrument, rather a way to use the interferometers which maintain the platform's position. By using two of these interferometers to lock onto separate fixed stars, the third could then be used to measure the relative motion of a third star to within 1/2000 of a second of arc. This can detect the telltale wobble of a nearby planetary system. It will also improve the parallax measurement technique by about 100 times, making accurate measurements at far greater distances.

Some of the astronomical objects that the Space Telescope will study at first include the following. The planets: Space Telescope will give us a resolution of the planets that was only possible with flyby spacecraft before. It also has the added advantage of an unlimited viewing time, rather than the very short view time of a flyby. Comets: Comets could be spotted farther out, and the solar wind and magnetic field can be studied by looking at fine details in the comet's tail. Stars: Single stars down to the absolute magnitude of the sun will be able to be resolved in globular clusters. Deep sky: Nearby galaxies could be studied in great detail while far distant objects, such as Quasars, will be resolved into a new light. Dark clouds in the Milky Way will provide a background for observing intrinsically faint stars and thereby providing data for their luminosity functions. An accurate calibration of the K correction used in red shift measurements will mean that this method will be more accurate in determining distances. As always in science, new discoveries will mean new questions, and with Space Telescope both discoveries and answers should be abundant.

I hope this article has increased your interest in the Space Telescope Program. If you desire further information, I would strongly suggest you

write to NASA directly. They are usually very helpful in answering questions.

Cadet Frank P. Adams Jr.

Editor's Note: Frank has always been an active observer and LAS member. Now he's an active organizer of the Charleston Amateur Astronomers in South Carolina.

MEMBER NEWS/NEW MEMBERS

Congratulations to LAS members Joe Pidich and Sharon Hughes on their recent marriage. May they have a lifetime of good luck. (Besides that, they get to save on their LAS dues.)

Joe Mazzarella was graduated in May from Penn State University. He was in the honors program and came out with a distinguished record and a double major in Physics and Astronomy. Joe is planning to do graduate work in Astronomy at the University of Michigan at Ann Arbor. (Next time you see him, just casually ask about Markarian galaxies.)

Please add these late renewals and new members to your 1983 member list:

Luann Naughton, 628 Moosic St., Scranton, PA 18505 346-6737

John Koshinski, 320 Atherton St.,(Old Forge) Duryea, PA 18642 457-7344

Jane & Ed Swarts, 205 Tulip Circle, Clarks Summit, PA 18411 587-4906

Joe Mazzarella, R. D. #3, Box 60, Clarks Summit, PA 18411 587-1524

Claude Fanucci, 726 River St., Peckville, PA 18452 489-3834

Sharon & Joe Pidich, 1258 Short Ave., Scranton, PA 18508 344-7185

A TALE OF COMETS

Of the comets I've observed my favorites are Comet Bennett (1970 II) and Comet West (1976 VI). They're not exactly startling choices, after all who can resist any object that, even while being viewed from a light-polluted site, still looks capable of causing war, panic, and pestilence. Naturally, since I teach 9th grade Earth & Space Science, I publicized both West and Bennett to my classes, but with only moderate success. I had to work against both peer and parent pressure, both groups sharing the opinion (more or less) that only a loony would get up at 3 or so in the morning, in late winter/early spring, to look at the sky. In fact, some of my success was only revealed to me the next year, when, as sophomores, a few kids would tell me (in strictest confidence) that they tried to, or did, see the comet or, as in one case, the boy even tried photography!!

Comet IRAS-Araki-Alcock, while lacking a spectacular tail, was a greater success than either Bennett or West, for several reasons. It was visible in the evening, came near to prominent constellations that they'd already become familiar with in projects, and was being pushed by the media, too. (If it's on TV too, maybe the teacher knows what she's talking about.) After I saw how bright the comet was on Monday night, and how rapidly it moved across the sky, I decided to let the kids observe the comet, plot its position at least twice on a star map, and count this as a substitute test/project for one I usually assign about the stars. The comet was so distinctive in appearance that even those who couldn't tell Polaris from Sirius had a chance to figure out where it was. The fact that there was only two nights when they'd be likely to see it prevented procrastination. Not only did most of the kids at least try for the comet, but I got a lot of good results back. One boy independently discovered averted vision. My most unmotivated class was the group that had the best results with many of them plotting positions for two nights. The amount of enthusiasm and classroom discussion the comet generated helped slow down my own case of "mid-May droop," too.

Comets, being such glamorous and mysterious objects, are about the only

thing (except for maybe Saturn) that will convince the public that amateur astronomy is more than looking at the "same old stars" all the time. Talk all you want about the subtle differences in what you see, depending on sky transparency, "seeing," aperture and magnification; or point out the effects of planetary rotation, and orbital motions, or describe the differences due to lighting angle on the moon. Mention the individuality of the various clusters, galaxies and nebulae, if you will, but people who are mystified by your ability to point out a planet or put a name to a bright star, are going to either believe you're giving them a "snow job", or else react as if the whole subject is too arcane for them.

Comet I-A-A gave us the thrill of discovery the night of May 6-7, 1983, when Bill Mecca came in from scanning Draco with binoculars, with a peculiar expression on his face from a close encounter with an ULNO (Unexpected Large Nebulous Object) in the sky. Galvenized into action, we spent an excited Friday night noting position, structure and brightness, even calling up John late at night at the risk of waking the baby, and trying to contact the Central Bureau for Astronomical Telegrams. The newspaper that morning had mentioned that a comet might be making a close approach to earth, but it had given no important particulars, so we didn't want to risk missing credit for a discovery by assuming our ULNO was actually I-A-A. The comet was visible to the naked eye then, once you knew where it was, about 5th magnitude. Joe Kamichitis took a Schmidt photo of it, before the clouds took over.

Saturday night, I had a glimpse of it in binoculars, still near Draco's head. By Sunday, John had gotten his circular on the comet which made us decide to make a concentrated attack on it. As we drove up I 81 to the observatory on Monday, the comet was plainly visible as a hazy patch near Kochab, between the two end stars of the Little Dippers bowl. It looked so much better than I anticipated. Once we arrived, I first tried to do ten things at once -- call my sister, call my parents telling them where to look for the comet, set up my camera, open cabinets, give keys to people so they could open up the Clark. When I finally stopped dithering about, I was able to join the others in observing and photographing. I used a fixed camera on a tripod; John Sabia and Joe Kamichitis used the Schmidt. It was a beautiful night, convincing me to make another attempt to motivate my students.

The next two nights when the comet came closest, the weather predictions were for clear skies, unless the storm to the northeast of us decided to back up a bit and spread out. Naturally the storm's clouds moved in from the north east both nights. Tuesday at 3:00 pm promptly Scranton, after a sparkling day was hit by overcast. In Scranton it cleared earlier than for KJCO; we had to wait for 11:00 pm to see the comet for any length of time, near the Big Dipper. (Coincidentally, this clearing occurred only after John announced to the clouds that he was going home.)

On Wednesday, May 11, public night, it stayed clear until 9:30 to 10:00 pm. When we led the public out to the 'scopes after the slide program, the view of Leo, Cancer and Gemini with M44 and the comet plainly visible (a description one of my students who was there disputes) was one of the most thrilling sights I've ever seen. (How I wished I had had the ambition to go to Fleetville for Comet West!!) This thrill was very soon followed by the sight of clouds moving in from the northeast with amazing speed. One of the ugliest overcasts I've seen, yet by 11:15 it had cleared up and we had another chance to observe the comet's rapid motion through the skies. All three nights the comet was seen as fan shaped with a much brighter nucleus towards the point of the fan. On Wednesday, it briefly had the appearance of a 10° tail as a faint auroral streak lined up with the comet!!

Comet I-A-A had me all psyched up for Comet Sugano-Saigusa-Fujikawa, plotting its expected path, making up handouts for the meeting, etc. Instead, all Comet S-S-F gave me was frustration. Even with an unusual stretch of clear moonless nights, I never did positively identify it. Maybe my mind was still too full of IRAS-Araki-Alcock to let me see a dimmer more stellar comet.

Jo-Ann Pluciennik

OBSERVATORY ASIDES

On behalf of the LAS officers and Board, I'd like to thank everyone who helped make the bus trip to New York and especially the Promised Land expedition successful. We had a waiting list for the bus trip, and even better, numerous telescopes at Promised Land.

I've always felt that one of the main advantages of membership in the LAS is that you gain access to instruments with a minimum of personal expense. You can borrow the clubs RV-6 loaner telescope, or come up to KJC/LASO and learn how much easier astronomy is with larger aperture telescopes than the usual beginners 2.4" scope. Plus you do get variety up there. If the classical 101-year-old 9" refractor is too intimidating or too gawky for you to use (but what images!!) try the club's homebuilt 12½" Newtonian. Leery of climbing aluminum ladders and reaching over a large tube to get to the eyepiece? There's the 10" Dobsonian, so simple to use it's almost cuddly -- a teddy bear of a 'scope. We've got something for everyone.

Here's another recommeded activity for you -- following the phenomena of Jupiter's moons. Last weekend, clear but marred by the full moon, we observed these with the 9", the 12½" and my 6" RV6.

June 25 (U.T.)	III Tr E (Ganymede comes out of transit of Jupiter)
	I Tr I (Io goes into transit)
	III Sh I (Ganymede's shadow starts and nearly completes transit)
	I Sh I (Io's shadow begins transit and goes about halfway across)
June 26 (U.T.)	I Ec R (Io reappears from being eclipsed in Jupiter's shadow)

When I first met Merton and Mildred Ruth, they spoke enthusiastically about Jupiter and its moons dynamic changes. Now I really know what they mean!! It just takes me a few years to take people up on their tips. It's interesting, too, to get used to using the Jupiter moon diagrams and decoding the tables in the club's copy of the RASC's "Observers Handbook"; and you finally get a practical, yet not deadly serious, use for Universal Time.

Some good nights coming up for viewing Jupiter's moons are July 3-4, July 4-5, July 12-13, July 17-18, and especially July 26-27 and July 29-30.

Jo-Ann Pluciennik

The "Ecliptic" is the bimonthly newsletter of the Lackawanna Astronomical Society. A subscription to the "Ecliptic" is one of the benefits of membership in the LAS. No permission is needed for nonprofit use of any material published in the "Ecliptic."

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